# Garden Steps: A Manual for the Amateur in Vegetable Gardening

Ernest Cobb

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# GARDEN STEPS

*Emil Adam*

Soft, in the mellow summer soil,
Sink heavy footsteps, silent, slow.
Seeking his shelter by the sun's last glow,
The weary mower turns him from his toil.

# GARDEN STEPS

## A MANUAL FOR THE AMATEUR IN VEGETABLE GARDENING

BY

ERNEST COBB

UNIV. OF CALIFORNIA

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# INTRODUCTION

THE food we eat, the clothes we wear, and the house which shelters us, are three great necessities of life. Of these three necessities, food is by far the most important. The ordinary family plans to spend a large part of the daily wages for food. If times are bad, we can live in smaller houses and be very comfortable. We can wear the same clothes twice as long as we expected to, and still not suffer from the cold. But with food it is very different. We must constantly provide ourselves with a nourishing diet, or our strength fails, health gives way, and great suffering is the final result. For a useful and happy existence, nourishing food is of the first importance.

During the past few years we have heard more and more complaints about the hardships which millions of people in America have suffered because of the high cost of nourishing food. During the period when the country was young there was plenty of food. The vast fields of the South and West were covered by the richest earth, which rewarded a small effort with a wonderful harvest. On the plains beyond the Mississippi, millions of cattle and sheep wandered and fed at will, providing us with the best of meat which cost little but the effort to bring it to market.

Gradually this has changed. The great cattle ranges are no more. Villages and farmhouses dot the prairies where, a few years ago, there was not even a fence. The



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fertile fields of the South and West no longer produce rich harvests almost unaided, as they did before. Now they must be fertilized and given careful culture.

At first one might suppose that this left a poor prospect for our future food supply. It does not; the prospect is as good as ever. It means that the whole plan of the family in regard to its food supply must be changed. What Mother Nature freely provided, almost of herself, she will continue to provide as bountifully as before, but now she must be helped in the work. Hereafter man must study the problem of his food supply and must stand ready to give the aid that Nature needs to insure an abundance of nutritious food.

Americans have just begun to understand the meaning of the high cost of food. For many years workmen hoped to relieve their condition by demanding higher wages. Step by step wages advanced, but the general food condition did not improve. The larger wages bought no more food than the small wages had. Indeed, frequently they did not buy so much.

The men on the farms had to feed the men in the factories and in the cities. As the farms became less easy to work, and harvests required greater labor, the number of those in the factories and cities who produced no food became greater. Food became scarcer and cost more. Then the men in the factories said, "We cannot live and buy food on the wages we get now. We must have more wages."

They got more wages. Then the factory owners had to raise the price of the shoes and hats and clothing they made, to pay the higher wages. Soon the farmer found

that he had to pay more for everything he bought, and the men he hired refused to work unless he paid them more, because their friends in the factory were getting higher wages.

There was just one thing for the farmer to do — pay his greater expenses and charge still more for the food he raised. It is perfectly clear that it makes no difference in this food question how many times the wages are raised. The farmer must meet the new expenses each time and get enough more for his food to pay the difference, or go out of business.

What can be done to relieve this situation? There is one way, and only one way, out. The number of those who grow food must be greatly increased. All must join hands and help solve the food problem. If this had been proposed ten years ago, the city people and the factory people would have declared that they had no chance to do this, that they had no gardens to work, and no opportunity to get any. But the terrible calamity which has fallen upon the world has proved all this untrue. City people and factory people *can* get gardens to work and *must* work them.

Even in our largest cities many acres of ground have been found available for gardens, and thousands, who formerly longed for something interesting to do through the idle hours of long summer days, have discovered the delight of planting seeds and sharing in the miracle of the growing and ripening crops. They are also learning that health and vigor come through hours of happy labor in the garden. There is no pursuit which brings more blessings in its train.

Every man who makes two blades grow where one grew before helps reduce the high cost of food. There is no other sure way. In the small gardens, which we now realize are, after all, available to all who really want them, enough can be grown to swing the balance and bring the cost of food within the earning power of the ordinary working man. This will relieve the pressure on the farmer, who can produce special foods, not suitable to the small garden, at a profit to himself and at a price within the means of the people in the factories and cities.

The terrible conditions which have opened the eyes of all to the possibilities around them for gardens and food production will soon pass away, but the food problem will never pass away. Unless the more bulky and perishable varieties of food are produced near home the same hardships which have beset the American people will return in double measure, till at last they are forced to a full realization of the food problem and how it may be solved.

No one, unless he has been through the experience, knows half the perplexities which beset the amateur gardener. Bewildered by a mass of information in detached form, much of which seems to contradict itself, he finds too late that important steps have been omitted and that he must wait a year before he can try again, with the lessons drawn from his first failure as a guidepost on the new path.

By gathering into one section the necessary information regarding the culture of each important vegetable for the home garden and arranging it so that the amateur may take each necessary step in its proper turn, guided by clear, explicit directions, we have endeavored to improve the chances of his success greatly and to save him from much of

the disappointment that is so frequently the lot of beginners in gardening.

Since this movement, like others of the same nature, must depend for its final success upon the children now in school, the needs of the classroom and school garden have been kept clearly in mind. Comparatively few children enjoy the privilege of expert guidance in plant culture and garden work. Consequently a text covering the subject thoroughly and written in simple language which the child can easily understand, will be found necessary to successful work.

Today almost every school is planning in some way to help solve the urgent question of the food supply. With Garden Steps in the hands of each pupil, the work may easily be made definite and successful. Instructions needed in the early spring, for planting, indoors and out, are fully given. During the summer months, when the pupil is not in touch with his instructor, the book will prove a sufficient guide in tending the growing plants. In the fall, when the crop matures, the young gardener will find in Garden Steps what he needs to know about gathering and storing away the ripened crop.

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*Rosa Bonheur*

FALL PLOWING IN FRANCE

Scenes like this are rapidly passing away. France is now importing farm machinery from America.

# GARDEN STEPS

## CHAPTER I

### FALL AND WINTER PREPARATIONS

#### Secret of Success in Gardening

Success in garden work is not a matter of a single year of study; it is a matter of long experience. Very few beginners ever get great results from the first season. If, after the first summer, with its struggles and disappointments, the amateur still looks forward eagerly to the next spring, determined to turn the mistakes of the past year into the successes of the next, he may be sure that he will not fail. This courage to return to the battle with fresh determination is the quality which marks the line between big men and little men.

So then, if the weather has been unfavorable, if bugs and blights have come unexpectedly, if weeds have crowded in, if sods have been heavy and the ground hard and lumpy, if the work has been a tax on muscles unaccustomed to labor, determine that instead of giving up, you will turn to use the experience thus gained, so that next year the crops

shall be increased and improved. Remember that you are helping to solve one of the greatest problems of the race, the food supply. There is no better test of determination of character than the garden. In the long run, failure is impossible to those who apply the qualities needed in the task. Nature knows no favorites. The rain falls on all alike, but the hoe and the harrow shall say whether the rain waters weeds or fruit.

## Fall Care of the Soil

Many of the most important steps in gardening must be taken in the fall. This is the time to look over the land for next year and plan for its preparation. If you are to use land which is at present covered with sod, the fall is the time to plow it under. If possible, all the land should be plowed at this season. Fall plowing breaks open the nests of many injurious insects that are wintering in the soil, thus greatly reducing their numbers when spring comes. It also makes the ground more open and porous, saves it from washing in the winter rains, and gives it more capacity to hold water in case of a drought in the early summer.

An additional advantage may be gained at this time if a catch crop of rye or clover is sown, to be plowed under in the spring. When the ground is harrowed, scatter about a quart of rye or a half pint of clover seed to the twenty-foot square, and

then rake it in with a wooden rake. These growing plants hold the moisture and keep the soil in place during the winter and spring months, and when plowed under, add humus to the earth.

The gardener should also make every effort at this season to get dressing for the coming spring. In the fall, farmers frequently have dressing to spare, but it is often impossible to obtain it at planting time. Besides, if the dressing is secured in the spring, it will probably be lumpy, hard to work into the ground, and most unsatisfactory to handle.

Ideal soil is the result of patient toil. Market gardeners take the most minute pains in preparing the ground for their crops, and the beginner should take their practice for his own. The author once saw men in France digging up the soil from the garden into large carts. These men were moving to a new place, and, by the French law, they had a right to carry with them the top soil of their little farm. It represented years of patient improvement. Every stone was picked out, the rich, dark earth was soft and fine, in perfect condition. They could not afford to leave it behind.

It is a joy to work in soil like this, and of course one year or two years will not produce it. However, careful preparation in the fall will make the greatest difference the following spring, and much of the next year's success depends on it.

In the first place, plow lightly, especially the sod

land that is to be planted the next year. Next, plan to dig or plow in a liberal amount of dairy or stable dressing before frost comes. In the spring, when this ground is worked over, the dressing will be well decayed and will make light and fine soil, which would be lumpy and heavy if the work were done in the spring with fresh manure.

## Soil for Early Seeds

While putting in the dressing, remember the cold frame and the window boxes. Save out a couple of barrow-loads and mix it about half and half with fine soil, leaving it where it will not be washed too

Tomatoes, Hanson Lettuce, and French Breakfast Radish in Cold Frame

The lettuce provided plants for setting out, and enough for eating during part of May and all of June. Cold frame is seven feet long by four feet wide. The back board is one foot high, the front board is six inches, and the side boards are one foot high. Pepper plants, which do not show, were also planted here.

much by the rains and surface water. When needed, this will be suitable for intensive planting. If the ground is likely to be frozen when soil is wanted for the window boxes, some of this earth should be put in a barrel in the cellar, where it will be available at any time. Do not let this soil get too dry. Water it enough to keep it moist.

### Ordering Garden Supplies

Besides the dressing, estimate how much of other fertilizers, such as nitrate of soda, lime, and commercial fertilizers, will be needed, and order them now. Fertilizer dealers try to estimate what the demand will be each year and do not mean to keep on hand any surplus. If the supply is exhausted in the spring, those who waited till then will have to wait longer still.

The same rule applies to tools and all supplies to be ordered from a distance. One does not mind waiting for a harrow a month overdue if that month is November; but in April, it is very different. Spring always catches some people unprepared; don't be one of them.

As the winter months come on, the garden plans should be laid out, and the necessary seeds listed and ordered. It is disappointing in the spring to order seeds which one is anxious to try, only to find them sold out.

Window boxes, markers for garden rows, stakes

for supports, bean poles, all the little accessories needed in the garden, should be made during the cold weather. The manual training room at school is an ideal place in which to construct these things. They have a vital interest for the pupils and most of them are very easy to make. When the garden rush is on, there is little time for making these supplies, and one is glad enough to have them ready.

As soon as the plans for the coming spring are complete, it will be time to begin starting seeds in the windows again. The year for garden work really has no beginning and no end.

INSPECTING SCHOOL GARDENS

# CHAPTER II

## GARDEN PLANS

THE right arrangement of the various plants in the garden, and the soil provided for each, will have much to do with the final success of the little farm. In some gardens the soil is the same throughout, and the only difference between one spot and another is the smoothness of the soil or the presence of water. In most gardens, however, there are some spots richer in humus and more suitable for cultivation than others.

### A SAMPLE GARDEN

In the author's garden, which is square and covers about an acre, there are several kinds and conditions of soil. In the southwest corner there is a piece about fifty feet square, where the loam is deep, full of humus, and fairly free from stones. The soil here was formerly acid and heavy. A dressing of lime, together with wood ashes from the fireplace, has greatly improved it, however. This is now used as the "kitchen garden," which will be described a little later.

North of this square there is a streak of gravel. This was the crown of a slight rise in the ground, from which the top soil has been washed off because of careless cultivation. This piece would be useless for most plants, but tomatoes, corn, or beans do well there. With plenty of dairy dressing beneath

TURNING OVER THE GROUND WITH A WHEEL PLOW

The plow turns weed roots up to the sun, which kills them. It also saves humus from washing out.

the hills, squashes also thrive on this gravel streak. The task now is to treat this piece with lime and humus, giving it a very shallow plowing each year, till a top soil is formed again. By fall plowing and by planting cover crops, it can be kept from washing away.

The rest of the westerly side is a light loam, not more than a foot deep, on a gravel subsoil. With

level cultivation and a soft surface, potatoes thrive well here.

In the center of the garden, running north and south, is the rhubarb bed, rich from good care during several years.

East of the rhubarb bed is a large piece of sandy loam, which is two feet deep in places. It is all on a gravel subsoil and needs a light dressing of lime each year to enable it to retain water. Here the asparagus bed is laid out. Beans, cucumbers, and the main corn crop thrive here; the soil is also perfectly suited to berries and small fruits.

## The Kitchen Garden

The farmer, who has his broad acres to cultivate, usually picks out some spot near the house where the earth is rich and fine, for a kitchen garden. Here he plants the vegetables for the home table which need special care and nice cultivation. The amateur, with his much smaller piece of ground, should follow the same practice.

There are some plants that need a great deal of room to grow in; fortunately, with good cultivation, these do well if left to themselves. Corn, tomatoes, squashes, and beans all push on cheerfully through long periods of dry weather and hot sun if they are started well. These are the vegetables which may be planted where it is most convenient.

BIRD'S-EYE VIEW OF THE KITCHEN GARDEN

From left to right, Mangel Beets for chickens, Lucullus Chard, Offenham Market Parsnips, Danvers Half Long Carrots, Edmand's Early Beets, Snowball Cauliflower, Crosby Egyptian Beets, Detroit Beets, Hanson Lettuce, French Breakfast Radish, Breadstone Ruta Baga. Tomatoes at the top, on gravel soil.

**Plants Requiring Special Care.** — There are other plants, however, which will do little if they are not nursed along and tended frequently. Such plants as lettuce, celery, beets, radishes, and cauliflower need the finest earth, and water at all times, to keep their growth up to the best. Where it is possible to have a hose that will reach every part of the entire garden, the problem is easily solved. Very few gardens, however, can boast the luxury of a hose. It is best, then, to select a special plot of ground large enough for these plants, and to call that the kitchen garden.

**Root Habits and Water.** — If we could watch a root as it works its way through the soil, we should see it turn towards the nearest supply of water. In digging out old wells, roots of trees have frequently been found, which have come more than a hundred feet to feed in the moist earth near the well. The tiny roots of the garden plants do the same thing on a smaller scale. They go toward the nearest water, wherever that may be. Their natural tendency is to go down into the earth, to seek water in the moist soil below them.

**Result of Frequent Watering from Above.** — Applications of water from a watering pot seldom moisten more than the top of the ground. When the rows are watered in the evening in this way, the roots detect the moist earth above them and turn in that direction. The next day, when the hot sun falls on the plants, the roots are near the

surface and soon feel the heat. The water quickly evaporates, and it is probable that the plants would be better off if they had not had any water at all, for the roots would then be well below the surface, seeking what moisture they could find.

Another bad result of frequent watering is the crust formed on the surface of the soil each time the ground is watered. This crust enables the sun to draw the water rapidly from the earth below. The only way to prevent this evaporation is to break up this crust thoroughly by cultivation. Of course, frequent water means frequent cultivation and an unnecessary increase in labor. So it is clear that if we use a waterpot or a hose at all, it is better to put on enough water to soak the soil thoroughly, well below the plants, once or twice a week.

**Simple Irrigation Plans.** — There are very satisfactory ways of applying water to a small area like the kitchen garden, without using the watering pot or hose. One can irrigate with empty cans, old water pipe, or tiling.

Empty cans, such as tomato cans or oil cans, holding a quart or more, may be sunk in the rows every few feet. Perforate the bottoms and sides, so that the water may leak through freely. Do not sink them between the rows, as they will interfere with cultivation. Fill these cans with water once a day. It takes but a moment to water a small patch by this method, and the water is admitted

below the plants without forming any surface crust.

Water pipe, which has been used but is still strong, may be obtained in almost every town at a very low price. This makes an excellent medium for irrigation. Prepare the pipe you intend to use by

IRRIGATION PIPES

A pail of water poured into these pipes is worth three sprinkled on the plants. It takes not one tenth the time and labor.

boring holes every foot, about one fourth of an inch in diameter. In one end of the pipe drive a plug. At the other end put an elbow, and an upright a foot or two long.

The upright pipe in the illustration is a little too

high; but no cutting tool was handy, so it was left. The only objection to the height is that it causes an unnecessary pressure of water as it leaves the holes, where it might wash away the dirt somewhat.

The pipe required to water an ordinary kitchen garden need not be very long. The pipe in the illustration is twenty feet, two lengths, five feet apart. This supplies plenty of water to those plants that need it most. For a larger space more pipe could be laid, connected in one system with a single tub as a reservoir.

When the ground is ready to plant, open a trench about a foot deep. Lay in the pipe with the holes down, so that the upright piece stands erect. Then fill in the earth again.

The paint kegs, used as shown in the picture, make excellent reservoirs. For the inch pipe, a hole measuring a trifle less than an inch was bored in the bottom of the keg, which was then screwed snugly on to the inch pipe.

If two or three pails of water are poured into these pipes every night during hot, dry weather, the plants will be well supplied with moisture.

A more expensive, but more desirable, way to irrigate is by means of porous drainpipe. This should be laid in trenches about a foot under the surface, and, if necessary, will provide not only for irrigation but for drainage. Clay pipe is used extensively in draining fields, as the water soaks into

the pipe and runs away from the land. When used for irrigating purposes, the water is poured into the pipe; it then soaks out of the pipe into the soil about it.

On the other hand, your garden may have a clay subsoil, and, while needing water in dry weather, may have too much in wet weather. Under such conditions you can lay the pipe so that it drains to the outlet. Make a plug for the lower end. In wet weather open the outlet and allow the surplus water to run off. Close the outlet and fill the pipe in dry weather to keep moisture about the plants.

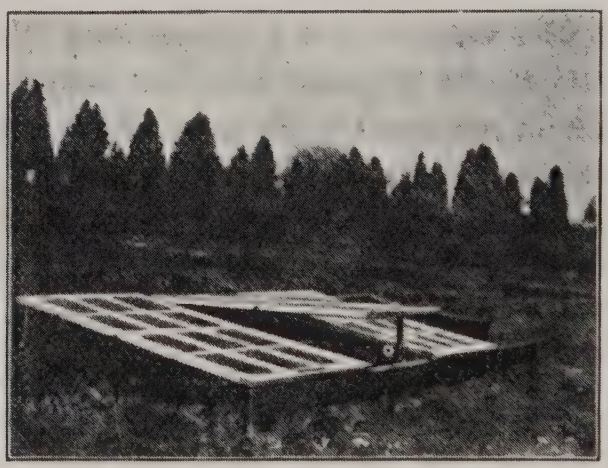
## Arrangement of Crops

Let us look over the garden land, then, and see just what we have. If part of it is full of gravel, that may be set off for plants which will succeed there. If water stands on certain parts of the land an hour or two after rains, such places should be drained. The best and most convenient part should be used for the kitchen garden. A sheltered place, on the south side of a fence or building, will be right for a cold frame. Fertilizer and lime can be provided according to the needs of the land. No work is more interesting than surveying your land and planning for its improvement.

## Succession of Crops

In many states the early crops are completed in time for another to be started and ripened during

the same season. Early peas, potatoes, and other crops that ripen by the middle of July, may be followed by beans, late cabbages, cauliflower, late corn, celery, and other plants, especially those that can be set out. Sweet corn does not ripen well in



COLD FRAME, WITH COVER RAISED, TO AIR AND HARDEN PLANTS TO BE SET OUT

The top of this cold frame is made of three double window sashes. It does them no harm if they are laid putty side up.

the temperate belt if planted later than the fourth of July. In the south, the season is much longer, and three crops can often be planted on the same land. After each crop, a dressing of commercial fertilizer is the best preparation for the next.

## ROTATION OF CROPS

A good deal has been said of rotation of crops. This changing the location of crops from year to

year is much more important on the large farm than in the garden. One five-acre piece, planted to corn this year, can be planted to advantage with potatoes next year. Crops thus exchanged drain the soil less and keep more free from disease and pests.

The garden, however, offers a very different problem. There may be parts of the garden well suited to certain crops. In this case it is more important to have suitable soil for the plants than a change of location. One can afford to feed the plants well on the small space and give them all the nourishment they need. The kitchen garden cannot well be moved, and this is not necessary if it is properly cared for.

Beans and peas should not be moved when a spot is found where they flourish. Such plants, known as legumes, seem to require the presence of certain bacteria in the soil. Wherever these bacteria are present, legumes flourish and will do better there than in new locations.

There are some crops, however, which may wisely be changed about. Corn and potatoes are easily moved in most gardens, and the soil is improved by doing so. Cabbages should also be changed from year to year, to avoid root maggots.

## Cleaning up the Land

It always distresses a good gardener to see a garden that is untidy. Stumps and roots cause many

extra steps each time the land is worked. Remember that every stone on the land draws out the moisture from the soil, spoils the dust mulch which should be kept on the surface by cultivating, and helps to keep the soil hard and lumpy.

NOT THREE YET, BUT HE IS AS GOOD AS ANY ONE ELSE FOR PICKING UP STONES

# CHAPTER III

## FERTILIZERS

In the growth of plants, four constituents are needed, which are likely to become exhausted in the soil. These must be supplied to most gardens after brief use and to all gardens after continued cultivation. They are nitrogen, lime, phosphates, and potash. When the needs of the crop expected are understood, the farmer can, by supplying these essential constituents, prepare most soils to produce good results.

A few years ago a man bought a large tract of land at a low price, on the northern end of the island of Newport, Rhode Island. Those familiar with the soil laughed when they heard that he planned to grow peaches there. They declared that the soil was so poor it would not even grow grass, which was true.

"All I want of the soil is to hold up the trees," he replied. "I'll feed them."

He did, and today a most profitable peach orchard flourishes on that barren strip. Being surrounded by the warm water of the bay, it is free from frost — the dread of peach growers.

## Needs of Plant Growth

Garden plants may be given fertilizers exactly suited to their particular needs. The study required in order to do this for each plant, however, is extensive, and not necessary for home gardening. Two general divisions may be made among garden plants. One division includes those plants wanted for their leaves and stalks, such as spinach, chard, cabbage, cauliflower, and lettuce. Into the other division go those plants grown for their seeds, like corn and peas and beans, or for their fruits, such as tomatoes and melons, or for their roots, like potatoes and other root crops.

The plants in the first division require a good deal of nitrogen, which stimulates the quick growth of tops. Those in the second group need less nitrogen and more potash, which increases the slower development of fruit, seed, and roots.

## "Complete" Fertilizer

There is a fertilizer prepared by reliable houses called a "complete" fertilizer, which may be used with success on all plants in the garden. This is the kind referred to in the following pages, when commercial fertilizer is indicated. But if the gardener wishes to study the special needs of the two groups, he can buy two grades of fertilizer, one for the first group, and another, usually called potato

DESERT LAND WITHOUT WATER OR FERTILIZER

SAME LAND IRRIGATED AND FERTILIZED

fertilizer, and rich in potash, for the second group.

In buying fertilizer, go to a reliable house familiar with the needs of farmers and buy high grade material always. By saving a few cents on the purchase price, much is lost in the crop. The complete fertilizer will be satisfactory for general work; but if a large crop of one vegetable is planned, study its needs a bit, and buy from your dealer something which he recommends for that particular plant.

### Animal Dressing

**Dairy and Stable Dressing.** — The term *dairy dressing* in this book will refer to manure chiefly from cows. *Stable dressing* will mean dressing mostly from horses and will include the bedding used in the stables. Dairy dressing is by far the most important fertilizer for the amateur gardener in most parts of the country. It not only contains the four essential constituents noted, but greatly increases the ability of the soil about it to hold water near the roots of the growing plants. There is little danger of using too much, and hardly any other fertilizer is needed if this can be obtained, with the exception of an occasional application of lime.

**Other Manures.** — Stable dressing is also valuable, but must be used with more care than dairy dressing. It is known as "hot manure," as it will heat

rapidly if left in a dry pile, and soon burns away its fertilizing value. It will also burn seeds if placed in the row with them and, unless it is well rotted, should be used in general only to dig or plow into the soil in the fall.

Manure from the sheep and pig are both rich in fertilizing values, and should be used under the advice of gardeners near at hand. Neither of these fertilizers will be generally available, except near large cities or in regions where these animals are kept.

**Poultry Droppings.** — A most valuable fertilizer available to many gardeners is provided by poultry droppings. This manure needs to be handled with some care, as it is too strong in nitrogen to be used freely with plants which do not require much nitrogen, such as beans and peas. It is, however, almost perfect for those plants wanted early in the spring for their tops, such as rhubarb, asparagus, and lettuce. As a lawn dressing it is unequalled, and may be scattered about on the sod at any time with safety.

Poultry droppings are so common in all districts and so valuable as a fertilizer, that some study of their qualities is well worth while. Being very rich in nitrogen and one-sided in this respect, it is best to add the potash which they lack and make them into a complete manure. For this purpose we may use kainit, which is a crude form of potash, well

adapted to this end. Kainit may usually be purchased from dealers in agricultural supplies; it comes in large bags at a dollar or so a bag. Before scraping the droppings from the roost, scatter about a quart of kainit with what will make a pail of droppings. When kainit is not available, twice the amount of rock phosphate may be used with good results.

Poultry droppings should not be exposed to the weather, if their full strength is to be retained. When mixed with the kainit, they should be put into barrels or boxes and covered over. The potash holds the nitrogen in the manure and preserves it in its best state. This dressing is most useful as a stimulater, after the crop is planted, but a little may be mixed with the soil at planting time. Put in enough dairy dressing in the fall, if possible, and make the earth light and soft. Then, when the crop is well started, this poultry dressing, quickly available, is a wonderful help to the growing plants, especially where tops are desired. It saves much in the expense of added dairy dressing.

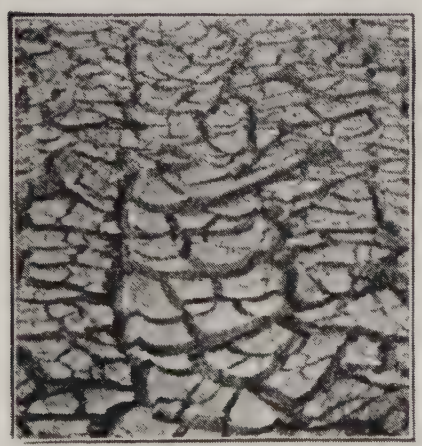
Where poultry droppings are plenty, and it is not convenient to cover them, they may be piled out doors. Thus exposed to the weather, much of the nitrogen escapes, and they become more nearly balanced as fertilizer.

Do not use such poultry dressing too freely on spots intended for fine cultivation. It tends to

make the ground hard and lumpy for a while. On the asparagus bed, or with corn or rhubarb, this is not an important consideration, and they may be used freely.

## Lime

**Direct Action of Lime on the Nature of the Soil.** — Lime is not only an essential constituent of plant food, but is of the greatest importance to the farmer through its beneficial action upon the soil. It



Clay Soil Badly Cracked

Same Type of Soil after Treatment with Lime

neutralizes the acidity in sour lands. It acts on the dressing that is dug in, hastening the decay of the vegetable and animal matter so that it will be more quickly and completely available to the roots. It also helps to increase the store of potash in the soil in suitable form for the plant to use, a most important service.

Not only does lime create more plant food for the growing roots to draw upon, but it also improves the physical nature of the soil. On heavy and clayey soil, it breaks up the lumps, separates the fine particles which cling together, and makes this soil open and porous. The clayey soil thus treated is able to hold moisture a much greater length of time, and is more even in temperature from day to day.

On light, sandy soil, lime fills up the chinks between the particles, which tend to be large. Thus the soil is made more retentive of water, which otherwise would soon run down into the subsoil beyond reach of the plants. In sandy soil, not limed, plants whose roots do not feed deeply are likely to be withered by the hot summer sun and die for lack of moisture.

**How to Secure Lime.** — Agricultural lime is secured from large seed houses or from dealers in farm supplies. It is not at all expensive, and every gardener should have it on hand. For some crops, like beets, a light dressing every year is recommended.

**Litmus Test.** — All sour or acid soil should be treated with lime at once. If you find a piece of ground where sorrel grows freely and where seeds sprout poorly, try the litmus test. Litmus paper may be procured from the druggist. It is blue. Place a handful of the soil you wish to test in a glass

or cup. Add enough water to turn it into thin mud. Then bury part of the litmus in the mud. In handling the paper, care should be taken not to touch that part which is to be tested, as one's hands may be acid. If the soil is sour, the paper will turn from blue to red. This shows that such soil needs lime.

The foregoing experiment is very interesting for classes in school. Many samples of soil may be brought and tested. If the soil proves acid, lime may be added till it is neutral and the paper stays blue. Put a tablespoonful of lime in a glass of water, stir well, and mix the water with the mud, a little at a time, till the desired result is obtained.

**Application of Lime.** — The amount of lime to apply varies with the condition of the land. For heavy, damp lands, it would not be too much to apply twenty-five pounds to each twenty-foot square, every third year. If the land is rather light and sandy, fifteen pounds every year for each twenty-foot square would be sufficient. As lime tends to wash away from light land, it needs more frequent dressings and rather more lime than the heavy soil. Do not apply the lime with the dressing. Scatter it over the surface of the harrowed land in the early spring. The tendency of lime is to work into the soil and gradually wash down through it to the subsoil.

## Wood Ashes

When cleaning out fireplaces or stoves where wood has been burned, put the ashes away carefully in a barrel. Wood ashes, if pure, are rich in potash, and offer it in a form immediately available to plants. Lime is also present, and an application of wood ashes on lumpy, hard ground has a very beneficial effect. This fertilizer is especially important with peas and beans. A few wood ashes, scattered along the rows, or in the hills with beans, are of great value. Keep them dry till they are used, as much of their value is lost if they are exposed to the weather.

## Humus

Humus is decaying animal and vegetable matter in the earth. It comes from the weeds and plants left in the ground, from leaves, and roots, and similar sources. In a natural state, plants grow and die in the same spot. The seeds fall about them and are nourished by the humus of the decaying plant. In this way the growth may continue year after year.

In the garden, however, plants are not left to die. They are carried away and used elsewhere. If this plan is continued long, there will in most cases be little or no vegetable matter left available to the plant, in the soil. When this happens, crops will be

very poor until humus has been supplied. This can be done by planting crops like clover, cow peas, or rye, and plowing them under; or it may be provided by adding manure to the soil. For the ordinary garden, the application of manure is the most convenient method and the most useful. For these reasons, it is not well to depend entirely on commercial fertilizers, unless the soil is very rich in vegetable matter. Dressing of some kind should be added to most soils each year, in order to keep the earth well filled with humus.

WHAT ONE BOY ACCOMPLISHED WITH ONE TWENTIETH OF AN ACRE

## CHAPTER IV

### SPRAYS AND POISONS

THE plant doctors are always at work compounding remedies for their patients, so that today we are happy in the possession of a cure for almost every evil in the garden. It is interesting to note the advice of an English gardener, given some years ago, to hill up the potato vines, drawing the earth snugly about the stems to keep the mysterious "blight disease" from creeping down and rotting the tubers. Of course this precaution was of no use against the tiny spores that cause the blight.

### BORDEAUX MIXTURE

After much research Bordeaux mixture was discovered, a compound of copper sulphate and lime. This wonderful remedy not only protects the potato vine against the blight, but also prevents many other plants from having fungus diseases of all kinds. Tomatoes, melons, cucumbers, beans, strawberries, and numerous other plants are saved from possible destruction by its use. Bordeaux mixture may be purchased at a seed house or at local stores.

The Pyrox mentioned in later pages is a compound of Bordeaux with arsenates, giving protection from insects and disease at the same time.

**Formula for Bordeaux Mixture.** — It is possible to make your own Bordeaux mixture at very little expense, if you wish to do so. In a two-quart fruit jar,

AFTER BLIGHT AND BUGS

The force pump is best for large patches. The boys can spray the whole crop from this position, with three gallons of Bordeaux and lead arsenate.

or some glass or crock holding two quarts of water, suspend a half pound of copper sulphate. Tie the copper sulphate in a piece of cloth and suspend it from a stick laid across the top of the full jar. In another vessel put one half pound of quicklime; add warm water till it is dissolved, and the mixture, when stirred, is about as thick as cream.

Pour the copper solution into a wooden or earthen

vessel which will hold three gallons. A stone jar is good for this purpose. Then strain the lime through a cloth into the copper solution, and mix thoroughly. Fill up with clear water to make the three gallons. Whenever you use this, stir it thoroughly. For potatoes, add a quart of water to each quart of the solution, as you put it into the sprayer. For beans or cucumber vines, add three pints of water to a quart of the solution. The potato can stand a stronger solution than most plants.

There seems to be some doubt about the keeping qualities of the Bordeaux mixture after the lime and copper sulphate are mixed; for this reason a small recipe is given. Three gallons of stock solution will, however, last half the season in the ordinary garden, and the amount can be increased to suit the needs of the crop.

**Application.** — Apply this spray on a clear day, using a pump which throws a fine spray with considerable force. Be sure that all parts of the plant are covered.

### Poison for Insects

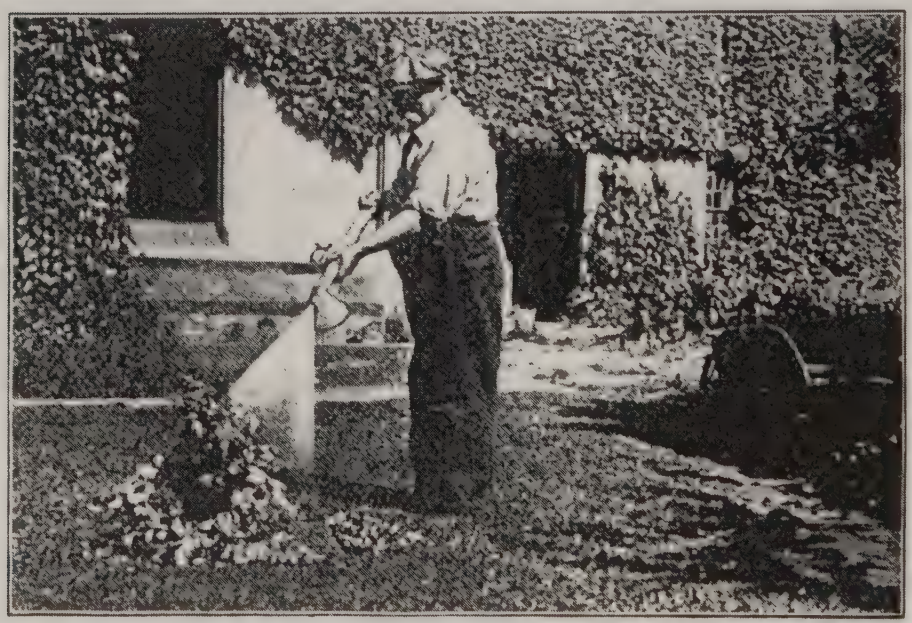
**Two Classes of Insects.** — Beside plant diseases, there are numberless insects to be repelled. These may be classed in two divisions — those that chew the foliage, and those that suck the sap. The potato bug is perhaps the most common and the most destructive of the chewing bugs. A poison ap-

plied to the foliage as a powder or spray will amply protect plants against these insects. The sap-sucking insects cannot be reached by ordinary means, for they thrust their needle-like beaks into the veins of the plant, where the poison does not go. Fortunately, these bugs have soft bodies and are sensitive to sprays or powders that affect their skins. The aphis, or louse, is the member of this group which must usually be fought in the home garden.

**Arsenate of Lead.** — In former days, Paris green was the chief agricultural poison, but in many places arsenate is now used entirely in place of Paris green. It is stronger than Paris green and clings to the foliage much better. If well dried on, a spray of arsenate of lead will stick through several rains, whereas Paris green will soon wash off. Arsenate of lead may be purchased as a paste or as a powder. The powder is the most practical to buy. It does not harden, and there is no expense for a jar. The paste must be packed in a sealed jar and will harden if not kept carefully sealed.

Arsenate may be applied as a powder, by shaking it on the plants from a tin box with holes punched in the bottom. The easiest way to use it, however, where more than a half dozen plants are to be treated, is in a spray. Mix the powdered arsenate of lead into a paste and then dilute with water. A heaping tablespoonful to a gallon of water will be sufficient.

It should leave a thin, white film over the leaf when it dries. All chewing insects are controlled by this poison. For convenience, arsenate of lead may be combined with the Bordeaux mixture. Simply add a heaping tablespoonful of arsenate, reduced to a thin paste, to a gallon of Bordeaux mixture.



THE HAND SPRAY

This is convenient for small gardens and odd spots about the house. It should always be kept loaded in the shed ready for use.

**Cutworm Bait.** — The cutworm has tricks of his own that require special treatment. He lives in the ground and comes out at night to gnaw at the stems of tomatoes, cabbages, onions, and other plants, just at the level of the soil. He is very fond of sweets. Mix a teaspoonful of powdered arsenate

of lead with a quart of bran, and make it into a paste with sweetened water; this he prefers to any other food. It kills at once all worms that eat vegetation. Sugar and molasses are equally good for sweetening. Drop the bait in small doses a yard or two apart on the soil you intend to plant. There seems to be little danger to birds or animals from this poison.

**How to Protect against Other Worms.** — Other worms with habits like those of the cutworm are always present, but seldom do great harm in the small garden. White grubs and wire worms sometimes harm the roots of growing plants. They are checked best by frequent cultivation. Plow up the land in the fall, and you will expose their nests and eggs to the cold, which will greatly decrease their number.

**The Earthworm the Gardener's Friend.** — Common earthworms, or angle worms, should be welcomed in any garden. They harm nothing and do much good, making the soil more porous, opening it to water, and refining the humus. The habit of digging them in the garden plot for fishing bait should be discouraged.

**Hellebore.** — There are some plants, such as cabbages and cauliflowers, on which it is not wise to use, shortly before they are to be eaten, such a powerful poison as arsenate of lead. In such cases, hellebore is a satisfactory substitute. This is es-

pecially valuable for currants. Shake the powdered hellebore among the leaves or mix a tablespoonful to two quarts of water and spray it on.

**Treatment of Sucking Insects.** — Lice, those little green mites which gather sometimes in great numbers on pea vines, cabbages, and other plants, get their living by sucking the sap from the veins and thus robbing the plant of its nourishment.

Tobacco powder is good to dust on such insects. It fills up the breathing pores of their bodies and kills them. Persian insect powder also has the same effect. The best and most generally used weapon against the sucking insects, however, is kerosene emulsion.

**Kerosene Emulsion.** — In preparing the kerosene emulsion spray, shave a quarter of a pound of good laundry soap and dissolve it in two quarts of water. Place a gallon of kerosene in a receptacle large enough to hold both the soap water and the kerosene. Into this kerosene, pour the soap water while it is boiling hot, and churn or stir vigorously for five minutes till the mixture is creamy. This will keep until wanted. For lice, plant bugs, and scale insects that suck the sap, take a cup of this emulsion, mix it with a gallon of water, and spray vigorously. It is a good plan, when vines are badly affected, to spray with this emulsion every three days, using a spray of clear water once in between, till the lice are gone.

The emulsion may also be used successfully against the root maggots that bother cabbages. Soak the ground about the roots. This usually kills the maggots at that point. Vigorous cultivation, however, is the best general protection against grubs.

## Care in Handling Poison

Always keep the poisons away from the reach of children and careless people. Do not trust hired help to handle poison, unless they are perfectly trustworthy. A spoon, used in mixing arsenate of lead and then in mixing chicken food, has dreadful possibilities. If you can, keep poisons in a chest under lock and key. Then you will know just who is handling them. Mark all such material with distinct labels.

Garden on the End of a Wharf

Less than twenty feet square, it provides tomatoes, pole beans, bush beans, beets, lettuce, radishes, peas, cucumbers, and squash — all made out of a dump.

# CHAPTER V

## TOOLS

It may be that a poor workman always complains of his tools; nevertheless, to be a good workman one must have good tools. In gardening, the best tools are not very expensive and contribute much to the success of the work.

**Wheelbarrow.** — A wheelbarrow should be one of the first things on the list. Barrows with iron wheels are the most desirable. They are light and strong. Best of all, the wheel does not swell and become loose if the barrow is left out in the rain.

**Shovel.** — One shovel is really enough in the home garden, though most people have two or three about the place. If only one is available, it should be square at the bottom, with a rather sharp edge. If one can have both a round, pointed shovel and a spade, so much the better.

**Spading Fork.** — This tool is needed frequently for digging, for handling dressing, and for turning over the soil in corners where the plow does not reach. Be sure the fork is manufactured by a reli-

able firm, and is of good steel, for great strain frequently comes on a single tine.

**Sickle.** — For trimming the long grass that grows about the edges of the garden, for work about trees, and for cutting corn stalks after the ears are picked,

WOODEN RAKE, CULTIVATOR, HEAVY HOE, LIGHT WEEDING HOE, AND IRON RAKE

a light sickle of high grade is often called into use. Keep the sickle sharp.

**Rakes.** — A wooden rake with teeth set close together is needed for smoothing garden ground and raking the lawn. Ask for a lawn rake, as hay rakes have the teeth too far apart for garden work. A steel rake with short, straight teeth is also needed for preparing the seed beds and raking about growing plants.

**Hoe and Cultivator.** — The principal use of the hoe is for opening small trenches and furrows. For cultivating and killing weeds, the best tool is not a hoe, but a potato digger with five or six round tines. The shorter the tines and the lighter the tool, the better. The sharp teeth of this potato digger sink into the ground easily, and work back and forth, leaving the dirt loose and fine without piling it up. It is also useful in turning over new ground. A sharp stroke and a pull will bring up a clod with little effort. In selecting tools of this sort, lightness is essential. A heavy hoe only requires more effort for the same result.

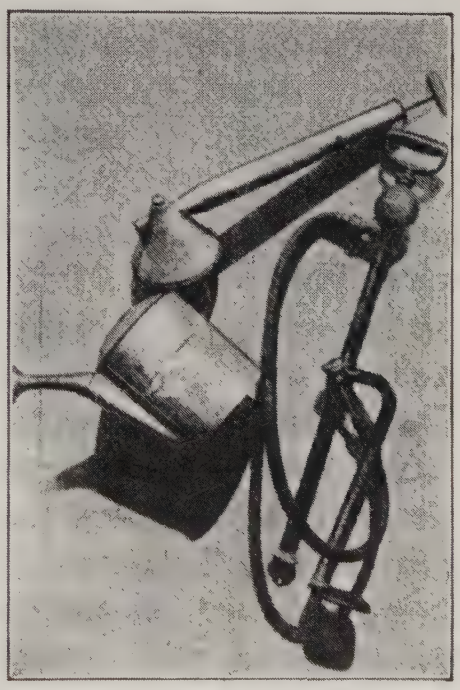
SICKLE, SMALL MASON'S TROWEL, ROUND-BLADED TROWEL, AND SMALL CULTIVATOR

**Trowels.**—Trowels are not expensive. Good ones can be bought in the ten-cent store. Have one large trowel with a curved blade for general use, and one small mason's trowel for working about the smaller plants.

**Wheel Harrow.** — Another tool for cultivating is the wheel harrow or wheel plow. This tool costs about five dollars, and is worth every cent of it, where the garden covers five thousand feet or more.

With this tool come a plow, a pair of hoes, and a set of cultivator teeth. After every rain, as soon as the top surface is dried a bit, bring out the wheel harrow. Run it up and down the rows and it will leave the earth soft and loose, ready to hold every drop of moisture in the soil.

With this wheel harrow a seeder is offered, which costs about five dollars more. This tool needs such careful adjustment for each kind of seed, that you will find it more satisfactory to plant the seed by hand. On a big place these seeders are necessary and do good work; but for the small plot or garden there is great satisfaction in knowing just where every seed goes, and the seeder is not used enough to justify its expense and extra care.



FORCE PUMP TO USE WITH PAIL, SMALL TANK SPRAY FOR DAILY USE, AND WATER POT

The force pump has no washers and never gets out of order.

**Spray Pump.** — Two sprayers are desirable. One should be large enough to throw liquid from a pail or tank with a good deal of force, either in a spray or a stream. This pump costs from three dollars up, accord-

ing to style and materials used in making it. It is used in spraying trees, potatoes, cucumber vines, and other plants which cover a good deal of surface.

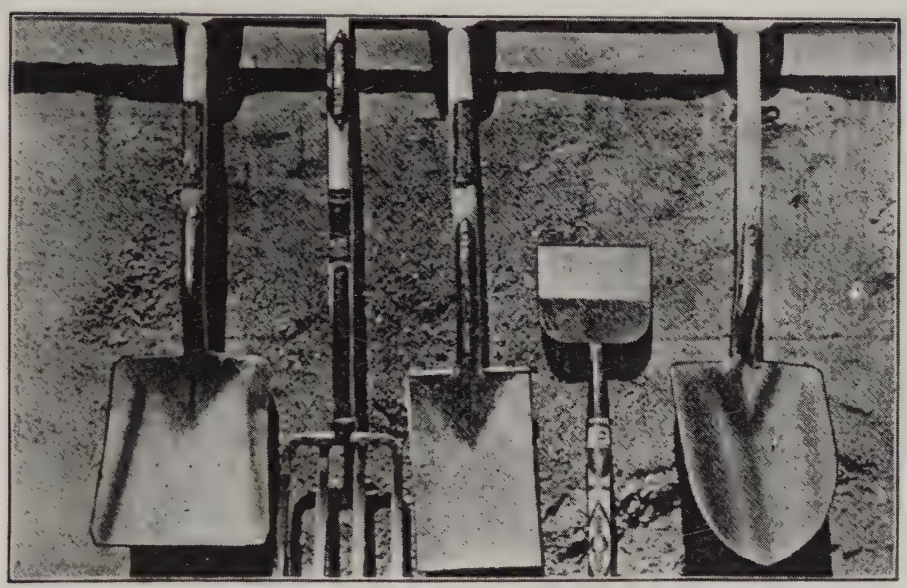
Besides this pump, get a small hand sprayer costing fifty cents, made from galvanized iron. This may be kept loaded with arsenate of lead solution, as it is needed almost daily to spray the small squash vines and plants of like nature, which are often attacked by beetles as soon as they appear above the surface of the ground.

**Watering Pot and Hose.** — If you can have running water and enough hose to cover the space provided for the kitchen garden, use it by all means. The plants there depend for their best qualities upon rapid growth, and rapid growth depends upon water, plenty of it. If the running water and hose are not possible, a watering pot is needed. A pot made of galvanized iron, and holding about two gallons, is the best.

**Iron Bar.** — Many people try to do garden work without the help of a bar, but if they realized the great advantage gained by the use of such a tool, they would not be without it. Bars vary in price according to their weight. Even a piece of old water pipe, five feet long or so, may be made of much use. Heat the end in the fire until it is red-hot. Then pound it into a point on a large flat stone. For setting the many stakes which are

needed each year in every garden, a bar of some kind is really essential.

**Line.** — A strong cord about one hundred feet long should be a part of every gardener's outfit. In setting out rows of vegetables, edging walks and



SQUARE SHOVEL, SPADING FORK, SPADE, EDGE CUTTER FOR WALKS AND GARDEN EDGES, AND ROUND-POINTED SHOVEL

gardens, and making the whole place neat and orderly, the marking line is constantly needed. A large fishline makes a good line for the garden, as it is free from knots and twists.

**Row Markers.** — In planting a fairly large piece of ground, thorough cultivation, economy of space, and general appearance all require that care be taken in marking the rows. These may be made

straight and of even width by the use of a marker, which can be made as follows:

Take a piece of two- by three-inch joist, six feet long if you want the rows three feet apart, four feet long

THE ROW MARKER

Draw it behind you and make three parallel rows at once.

if you want them two feet apart, and so on. At the center, nail on a piece of scantling about eight feet long for the handle. For braces, nail strips obliquely across to the heavy piece, one on each side. Small pieces about seven inches long and sharp at one end, should be nailed firmly to the body piece, at distances as needed for the rows. When finished, this will look like a long rake with three or more teeth.

In marking lines, measure the first row, and then draw the marker behind you so that the outside tooth follows this line. The other teeth mark rows which are parallel.

Where many people work together, as in school gardens, two or three of these markers with teeth measured for various distances between rows, can be made in the manual training room, and will be of much service in planting the larger seeds, such as beans, peas, and corn.

**Stakes.** — During the winter months provide yourself with twenty-five or thirty stakes to set at the heads of the rows. These can be made in school if tools are provided there. Narrow cedar shingles are especially good, because cedar does not rot, and they can be used year after year. Cut off three inches of the thin end; point that end and smooth the other with a plane. A piece about two inches wide is large enough to write upon. If shingles are not at hand, pieces of boxwood will serve.

STAKES FOR MARKING ROWS, MADE FROM SMALL SHINGLES

**Grindstone.** — If you have ever had a grindstone, even a small one, you will never want to be without one. It is used in twenty ways every week. By means of a grindstone, axes and hatchets, table knives, trowels, shovels, hoes, and many other tools can be kept in good condition with little labor. The expense of a small grindstone is not great, but if you do not feel like spending the money for that, then get a whetstone and a large file, and be sure to use them on your garden tools when they get dull.

HOEING AND CULTIVATING A FIELD OF POTATOES

# CHAPTER VI

## ASPARAGUS

PREPAREDNESS has no greater significance as to garden work than in relation to asparagus. It is hard for people to plan and plant a crop which may not be garnered for two years, but there is something impelling in the world situation today. Those who never looked ahead before are looking ahead now. As part of the obligation we owe ourselves and those dependent on us, why not lay out an asparagus bed?

Asparagus is more than a vegetable; it serves the purpose of meat also with many people. Few there are who do not consider a dish of asparagus on toast a treat, a luxury which only the rich can afford; yet nothing is easier to grow and care for. The first plant, after the rhubarb, to appear in the spring is this delicious vegetable. During the six weeks before strawberries ripen, a small patch will provide daily for the needs of the average family. Once grown, it will continue to bear almost indefinitely. There are beds over fifty years old which still produce good crops.

## Kinds to Choose

**Danger of Rust to Certain Varieties.** — In certain parts of the country, asparagus has suffered from rust, a disease which kills the plant by attacking the foliage. Some gardeners who made asparagus their main crop almost gave up in despair, because no remedy could be found for rust. Then it was discovered that certain varieties of asparagus are free from this disease. By choosing these types, the growers have escaped the ravages of rust.

Argenteuil Asparagus

**Hardy Varieties.** — The *Argenteuil*, the *Reading Giant*, and the *Palmetto* are all varieties which have been very successful and hardy. Before deciding on the kind you wish to plant, however, write your state agricultural experiment station and the department at Washington. Constant attention is being given to this plant, and great efforts are being made to provide types which will thrive in every locality. It is safe to plant asparagus thus recommended.

## Methods of Planting

**Fertilizing.** — The methods of planting recommended formerly by all, and still required by most, writers on this subject have been expensive both in dressing and in labor. A detailed study of the asparagus plant and its habits shows that much of this labor and fertilizer has probably been wasted.

Asparagus should be harrowed and fertilized when strawberries are ripe. No more asparagus should be cut after this.

The customary method has been to dig deep trenches, even as far down as four feet, and enrich the ground heavily with large quantities of dressing. It must be admitted, however, that the root will probably never get full value from a large amount of dressing used when planting. It is four years before the root is large enough to draw greatly on this fertilizer, and by that time the soil will need a fresh

supply. Moreover, there is little to prove that the asparagus root draws on the soil beneath it for much of its food, when once started. The root spreads chiefly not downward, but horizontally, and even tends to work upwards, hunting for nourishment and air.

The French, who have attained great success with asparagus, plan to feed the roots from above each year. Progressive American growers, who have started the roots with very little dressing and increased the amount as the roots grew, have been rewarded with such good results that they will never again resort to the expensive plan of deep digging and the use of a great quantity of dressing when the roots are set.

**Growing from Roots.** — Asparagus may be grown from seed, but, as enough one-year or two-year roots for the ordinary garden cost less than a dollar, and save at least a year in time and a good deal of labor, it is not worth while to grow from seed. The sale of a fraction of the crop the third year will more than repay the extra expense for the roots. The roots should be set during the spring, except in the South. In the northern states the roots are not ready to transplant till after the growing season is passed. They would make little growth if planted then, and would be likely to die during the winter.

**Preparing the Soil.** — For the ordinary garden, the following plan should prove simple, inexpensive,

and successful. Select for asparagus the most level spot possible, provided with good drainage; for the soil will tend to wash away, and the roots may be exposed before long, if on a slope. Sandy loam is the best soil, though any good garden land will do. When the earth is warm, lay off the plot into rows three feet apart, after digging it over with the spading fork at least a foot deep and removing all large stones. Along these rows, scoop out the earth in a trench about ten inches deep and fifteen inches wide. See that the bottom of the trench is loose, and mix with the soil, thus loosened, dairy or stable dressing, about a barrow-load to every twenty feet. This dressing should not be too fresh; if partly rotted and free from heat, it will do.

**Setting Out.** — Into the bottom of the trench, set the roots two feet apart, so that they will spread out freely in all directions and the crown will lie six inches beneath the level of the soil. Then put back two inches of the soil, gathering the earth firmly about the roots. The distances for separating the roots may be a trifle less than two feet, in rows three feet apart; but if the bed is to be permanent, the roots will, before many years, spread so that they will need even more room than two feet. In old beds, where ample room has not been provided, the roots crowd and choke one another. This soon reduces the size of the stalks and spoils the crop for market.

### Cultivation

**The First Year.** — When the shoots appear, fill in the rest of the soil gradually, mixing dressing with it, a barrow-load to each twenty feet of soil. If the spot is windy, support the slender shoots with stakes driven in along the row. Of course no sprouts will be cut for food the first summer. In the fall, before the berries drop, cut down the tops and take them away. If the seeds are allowed to ripen on the bed, the young plants that sprout from them will prove troublesome weeds the next season. Then cover the bed with dressing of any nature, enough to form a protective mulch during the winter.

**The Second Year.** — The next spring this dressing must be dug or harrowed into the soil, which should be well loosened over the bed. After the cutting has stopped, apply some fertilizer which will be immediately available to the plant. Five pounds of nitrate of soda or commercial fertilizer to a twenty-foot square is the best, and more will do no harm. The next year's crop will depend upon the strength of growth during July and August. The roots are then storing up the nourishment needed for pushing out shoots the next spring. Everything, therefore, must be done to encourage strong growth of the tops during the summer.

**Later Care.** — Every fall hereafter, the ground should be mulched with dressing, to be harrowed in

the next spring; a new application of fertilizer may be harrowed in again when the season for cutting is over. By this method the roots receive nourishment when it is needed, especially during each summer season, and there will be no loss of crops from

ASPARAGUS THREE WEEKS AFTER HARROWING
When crop is cut, about strawberry time, harrow the bed.

lack of support. The large expense for labor and dressing at planting time will be saved, and you will know what nourishment the roots are getting, and when they get it.

**Use of Salt.** — Salt is often recommended for asparagus. It is valuable in two ways. It helps to check the weeds, and it keeps the ground more moist, drawing the dampness from the air. Do not use salt in place of a fertilizer, however. It has little nutritive value. It probably does make the

fertilizer used more available to the plant; but the full measure of dressing and other fertilizers should be given, whether salt is used or not. Salt may be scattered freely among the plants without fear of harm.

### Cutting Asparagus

The sprouts which come during the first three weeks the second year may be cut, but cutting should not continue longer than three weeks. When cutting sprouts, take them all, big and little, and stop cutting completely when the time is up. Cutting the stalks may begin regularly the third year, and may continue from the time they come up in April till strawberries ripen, about July first. Never leave the small shoots to form tops, as they will draw strength from the roots and retard other stalks. During the cool weather, once in two days is often enough to cut; but when the sun gets hot, the beds should be cleaned up each day. All stalks five inches high should be taken.

The cutting is done with a knife made for the purpose. It has a sharp end. Thrust this into the earth an inch away from the stalk, and cut down obliquely, so as to cut off the shoot an inch or so below the surface. Be careful that the knife does not continue down and cut other shoots beneath the surface, or injure the crown itself. If it is not convenient to get an asparagus knife, a putty, or glazier's, knife with the end well sharpened, will do.

Wash the stalks and tie them in bunches weighing about a pound. Raffia for this purpose can be bought from seed houses. When bunched, the asparagus should stand in a pan in a cool place. Pour in enough water to cover two inches of the stalk. Asparagus will be improved by standing thus a day or two. It will be more tender and have a better flavor.

BUNCHING ASPARAGUS

The bunching frame holds a pound and a quarter when full. It has slots for the raffia.

## BANKING ASPARAGUS

Some gardeners bank the hills with earth to get white stalks. This is always done at the expense of flavor. The stalk is usually slightly bitter and strong till it has been exposed to the air and sun. Years ago the white, or blanched, asparagus was in demand, but markets now usually quote the green asparagus at higher prices. The public has discovered that the latter is superior in flavor and quality.

## Enemies

Besides the rust, already spoken of, and for which no satisfactory cure has been found, the stalks are attacked by a small beetle which sometimes, though not frequently, does a good deal of harm. The best way to check this pest is to let chickens run in the bed. A flock of chickens is the ideal caretaker for the asparagus bed. They will fertilize it, cultivate it, keep the weeds out, and eat every beetle that comes around. Certain precautions, however, must be taken. It is often said that chickens will not eat asparagus, but this is not true. They will eat the stalks and spoil them, if other green stuff is not at hand. Care must be taken, then, not to have the flock so large that they eat all growing green stuff. If you can inclose a bit of sod ground with the asparagus, that will satisfy their appetites for green food, and they will not touch the stalks.

# CHAPTER VII

## BEANS

### Food Value of Beans

Travelers tell us that few people in this country realize the important place which beans take in the food supply of the world. Those who have been in India and other eastern lands say that we are mistaken in thinking that rice is the chief article of diet in the East. Beans, they report, are found everywhere a staple food, of the greatest importance in the lives of the working classes.

### String Beans

The advance which has been made recently in the culture of beans is wonderful. Twenty years ago string beans were well named, for they certainly had strings and plenty of them. They produced a cluster of pods which, if picked at just the right moment, were edible, but which at once became tough and coarse if left on the bushes.

Today there are many varieties which are edible for some time, and a few which continue to produce

RUST-PROOF GOLDEN WAX BEAN

delicious beans for a great part of the summer. It can hardly be said, as yet, that beans are really stringless, although many growers advertise different kinds as "stringless beans." All beans develop strings sooner or later, but it is now possible to leave them on the vines for some time and still find them brittle and free from tough fiber.

**Bush String Beans.** — The first beans of the season will be the string beans which grow on low, sturdy bushes. If the sun is warm and the weather fair, beans may be served at table less than eight weeks after planting.

Almost every seed house offers bush string beans which they can recommend for your locality, and you are reasonably sure to get a good bean by choosing from their catalogues. There are two varieties, however, the *Valentine*, and the *Early Six Weeks*, which have been tried all over the country with much success; these may be trusted to give good results everywhere.

**Giant Stringless Green Pod Valentine.** — This is a green bush bean, developed lately from the *Valentine* family. The vines are productive and hardy. The pods are large, almost round, and are free from the rust which attacks many beans, covering them with brown spots. This bean is not the earliest, but is well worth trying in any garden.

**Early Six Weeks.** — This green-podded bean is one of the earliest. It has long pods which are

rather flat, and the quality is good if the beans are picked while young. The pods soon become coarse and stringy if left on the vines, while those of the *Giant Stringless* keep their excellent table quality much longer.

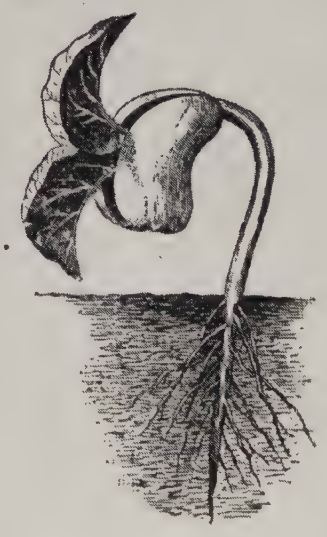
**Bush Wax Beans.** — Of late years, there have been developed many excellent bush beans of the yellow, or wax, variety, such as the *Golden Wax*, and *Wardwell's Kidney Wax*. If you wish to try some of the bush wax variety, a safe way is to ask your seedsman for the best wax bush bean to grow in your locality. Beans vary somewhat as to hardiness and quality, according to climate and conditions, and you may depend upon any reputable seed house for advice regarding this type of bean.

**Culture of Bush Beans.** — Beans are easily injured by frost and should not be planted until the cold nights are past and the ground is warm and mellow. Market gardeners who raise them in large quantities each year often plant them soon after the peas. Then they plant others in the same row, about a week later. If the first ones grow well, they simply pull the second lot out as they sprout; but if the first seeding is hurt by wet or cold, they have the second planting to depend upon. See that the ground is not too wet. Rake the earth until it is soft. Measure the space intended for beans and lay out a line with the cord. Then open a furrow two inches deep along this line, and sow

the beans about half an inch apart. Rake the earth back into the furrow and pack it to be sure it is firm above the beans, scratching it gently with the rake to break up the surface crust.

At least two feet should be left between the rows. Be sure to leave a stick at each end of the row to show just where the beans are planted.

After a few days of warm sun, the earth will crack, and the whole bean, greatly swelled by the moisture it has absorbed, will begin to push up through the ground. The little root below has strength enough to lift this weight and force it through the earth into the sunlight. As soon as it comes above the ground, the healthy seed splits in the middle, and the first leaf appears.



BEAN, SHOWING FIRST LEAF AND ROOT GROWTHS

Now is the time to look over the row. Some beans will be weak and yellow. Pull them out at once. If some are less than an inch apart, thin them out also. Watch them for another week. The cutworms will get some probably, and accidents may happen to others. Soon it is time to thin them out again, leaving them not less than four inches apart.

Be sure that the ground is kept soft and loose

about them with the cultivator, and once or twice as they grow, take the trowel and clean the weeds from between the bushes.

Beans are very delicate. · Do not work among them during a rain or while the leaves are wet, for they are likely to become rusty if you do.

BEANS ARE A GOOD CROP FOR THE AMATEUR TO RAISE

In about seven weeks the pods should begin to form, and after a few days they will be ready to pick for the table, as they grow rapidly after the blossom falls. Don't be one of those people who insist on leaving the beans till they are big, before letting the family enjoy them. Better a few delicious, small beans, than more tough, large ones.

**Pole String Beans.** — By developing the tendency to grow long vines and by careful choice of seed,

several varieties of pole string beans have been brought out that bear larger crops than the bush varieties. In the small garden, space is always a consideration. By growing pole beans which are prolific and which keep on bearing pods for some time, the gardener will get far better returns for the work done and space used, than from the bush varieties.

**Kentucky Wonder Wax.** — A few years ago a new green pole bean appeared which attracted much attention and spread rapidly throughout the country — the *Kentucky Wonder*. It was good as a string bean and also as a shell bean. This remarkable bean has now been developed into a wax bean — the *Kentucky Wonder Wax* bean. It begins to bear almost as soon as the bush beans, and delicious beans have been picked in November from vines which began bearing in July. The pods are pale yellow, very thick and fleshy, and have a delicious, buttery flavor, which make them truly "butter beans."

The pods, of course, get stringy if left on the vines long, but there is no need to eat the large, stringy ones, as the vine is constantly producing new pods. If the beans grow faster than you wish to eat or can them, several poles may be left, to use as shell beans. Eight poles are enough for the average family.

There are other good pole beans, such as the *Golden Cluster*, a very early wax bean of good qual-

ity; the *Lazy Wife*, of especially rich flavor; and the *McCasland*, a new bean much praised both as a string and a shell bean.

### Shell Beans

It is a good plan to plant two sorts of shell beans which have been found especially good, besides those you try as an experiment. Follow the plan of sticking to something you know to be good, but always be ready to try any new plant which might prove better still. In this way you avoid losing a crop and also keep from getting in a rut. Staying in ruts has been a costly habit among farmers all over the world.

**Red Cranberry Shell Bean or Horticultural Bean.** — It is hard to get a shell bean which is surer to give a good crop, even during a short season, than the old-fashioned *Red Cranberry* bean, which now appears all over the country, in excellent strains. This bean is most desirable for eating as a shell bean before it ripens, and after it is ripe and dry, it is excellent for baking. It ripens quickly and is very hardy. It may be grown as a bush bean or a pole bean.

**Lima Beans.** — Several desirable Lima beans brought out during the past few years have proved valuable. In the northern states, where frost and cold nights come frequently in early June and late August, there is not much hope of ripening Lima

beans. Where there are three months of warm weather, however, there is good hope of getting a crop, and they are so delicious and valuable as a food, that the effort to produce them is well worth while.

*Dreer's Bush Lima* is a hardy sort, with a small pod and small beans of excellent quality. It ripens quickly and fills a large number of pods at the same time. *Dreer's Pole Lima* is of the same nature, with small pods and hardy, quick-growing vines.

CORN AND BEANS PLANTED TOGETHER — A GOOD COMBINATION

The beans take little nourishment needed by the corn. The poles have swinging corn cobs to frighten birds away.

*Burpee's Improved Bush Lima* has large pods, which seem to require more time to fill out in large numbers than the smaller pods. The beans are excellent as to flavor.

The *Sieva Lima* is a variety grown for many years by market gardeners in New England. It is very

prolific and shells out easily, having a good color and flavor.

In offering the *Carpenteria Lima*, its growers called it the most perfect Lima bean in existence. It is very hardy, it ripens quickly and evenly, and it is a prolific bearer of delicious, large, green beans.

**Culture of Pole Beans.** — First, procure the poles. The best pole, and the one most used in country places, is the small cedar tree. These are not easy to get in towns today, though most seed houses carry them at about a dollar a dozen. The most handy pole to buy is scantling from the local lumber yard. These cost about fifty cents for a bundle of ten, in eight-foot lengths.

If you use anything but the cedar pole, or a sapling which has knots and little branches, remember that the bean must have something to rest on as it climbs. Bean vines cannot cling to the smooth sides of cut lumber, and when the vines are loaded they will slide down, leaving the foliage in a mass at the bottom, where it will spot and decay. By nailing bits of lath or shingle to the pole, every foot or so, you will give the bean a chance to keep up in the world.

When you have the poles ready, be sure the ground is well fertilized and well turned over. Get out your line and measure spots for the poles at least two feet apart each way. Four feet is not too much if you have the room, especially for the Lima beans.

Take your bar and drive holes eighteen inches deep. Don't be satisfied with a foot, or you will find your poles all down some morning in August, after a storm. The weight on these poles, when the vines have grown, is much greater than you would suppose. Set the poles in these holes, and stamp the earth firmly about them.

For the *Cranberry* beans and *Kentucky Wonders*, make six holes, eight inches from the pole, and

JACK, DOING "HIS BIT" ON SHORE LEAVE

Poles for Cranberry pole beans.

not more than two inches deep. Into these drop two beans each, cover, and make the earth firm above them. Add a couple of holes, a trifle nearer the pole, and put in four more beans, in case you need extra sprouts. When these have started well, pick

out the five best plants and snip off the other beans. It is not wise to let more than five grow on one pole, and four will do as well.

In planting Lima beans, make the earth very fine. Then take a bean between your thumb and finger, with the eye down, and thrust it into the soil the length of your finger. The root comes out from the eye, and if the bean is above the eye, it is in just the right position to be forced up through the earth without delay. If the eye should be uppermost, the root must crawl around the bean before it can begin to push, and much delay is the result. Time is important in growing Limas.

Do not plant a Lima bean out of doors until the leaves on the maple trees are well out, and you are sure the earth is warm. The slightest cold will stop the seed from sprouting. It is useful, when the spring is late, to cut a few pieces of sod, four inches square, and put them upside down in a window box. Lima beans may be thrust into the sod and sprouted there. Later the sod may be placed by the pole, without in any way hurting the tender roots. Few people have much success in transplanting beans sprouted in pots or baskets.

If the runners of the Lima bean tend to spread, they may be tied to the pole with soft string. They will then go up the pole as they should.

Along in August, if the season threatens to be short, pinch off the ends of the Lima vines and let

the whole strength of the vine go into the pods; otherwise many small pods, which will never mature, are likely to form at the top of the vine.

**Threshing Beans.** — If many beans are left to ripen for the winter, they should stay on the vines until they are fully ripe. The vines should then be pulled and thoroughly dried. If there is room in some sheltered spot, like the loft, spread them out there. If such a room is lacking, they may be dried out of doors. Drive two stakes into the ground about fifteen inches apart. Place a small box on the ground between them, to keep the beans from resting on the ground, and pile the vines in between the two stakes, making the pile about four feet high. In two or three weeks of fairly dry weather, they will be ready to thresh.

An excellent way to thresh them is to thrust the beans into a grain sack, tie up the end, and beat it with a heavy stick. This should be done when they are perfectly dry. The beans will settle at the bottom of the sack when they pop out of their pods. Cut a small hole in the bottom of the bag at the corner and let the beans run out. They will escape, leaving the pods behind them.

# CHAPTER VIII

## BEETS AND CHARD

### Soil

**Importance of Right Kind of Soil.** — No vegetable depends more for its quality on the nature of the soil about it than the beet. Beets will grow in different soils and will produce something in the way of a crop even when the soil is poor; but such beets are hardly fit for hash. To grow beets which are tender throughout, free from fiber and tough spots, and which have the sweet flavor so much desired in these vegetables, be sure that the soil where they grow is rich, free from acid, and worked into a high state of cultivation.

**Fall Preparation.** — The best way to make sure of perfect soil is to work it over in the fall and mix a liberal application of dairy dressing well into the land. Use at least a barrow-load to a twenty-foot square. Then, in the spring, harrow in five or six pounds of agricultural lime to each twenty-foot square. Just before planting, rake into the row a pound of complete commercial fertilizer for each fifty feet.

**Fertilizer.** — The advantage of the commercial fertilizer is its quick effect on the seedling. Being pulverized and well mixed with the soil, it warms the young plant and gives the roots a good start before they are able to reach out and draw their nourishment from the coarser dressing about them. An examination of the beet root will show that it is very different from the long, wandering feeders of the corn. Its main taproot goes straight down several inches, and the small feeders branch off from that only an inch or two. This shows us clearly that the fertilizer must be directly below the beet and must be worked deeply into the earth, which is soft and porous to allow free passage for the taproot.

Lime is especially required for this crop, as beets are hard to develop where there is acid in the soil. Lime will neutralize the acid, will make the manure in the soil much more available for the plant, will help keep worms away, and will make the soil more porous and fine.

If dressing is not available, twice as much commercial fertilizer may be used, and a pound of nitrate of soda, scattered along in the fifty-foot rows before planting, will help keep the moisture in the soil about the roots.

### Varieties

Three varieties of beets are highly recommended. As the seed is not costly and the plants take little

space, it would not be too ambitious to try them all.

**Egyptian Blood Root.** — This beet has a hardy nature and develops the edible root while the top is still small. It is universally recognized as the best early beet for the home garden. The taproot is small, the shape is round and even, and the flesh is a handsome dark red, of excellent flavor. This beet may be had in various strains, according to local tastes and conditions. In the East, *Crosby's Egyptian* is the most approved, and market gardeners pay very high prices for seed especially selected from this strain.

**Detroit Dark Red.** — Many experiment stations and departments of agriculture send out the seed of the *Detroit Dark Red* beet for school and home gardens. It has a fixed type and is of strong growth. The dark red roots mature very evenly in size and shape, and the flavor is excellent. It takes rather longer to mature than the *Egyptian* beet, and is an excellent variety to grow for midsummer use and for canning or storing for winter.

**Edmand's Early.** — The *Edmand's Early* beet always finds an honored place in the author's garden. It has one quality which makes it unusually adapted to the home garden — it grows large and heavy without losing its tenderness and flavor. Specimens of this beet weighing nearly two pounds have proved of tender quality and excellent flavor. This is very

important in the home garden, for it is a great advantage to be able to leave beets in the ground, and to pick them as you need to supply the table. The *Edmand's Early* is sweet and tender, excellent in every way as a main-crop beet.

EDMAND'S EARLY BEETS

## PLANTING

**Time.**—Beets are hardy and may be planted early as far as cold spells are concerned; but the young plant is delicate and has not much lifting power. If planted during April, and left in the ground during a fortnight of cool, damp weather, few beet seeds will have the strength to push up through earth thus hardened above them, and new plantings will be necessary. It is better to wait till the ground is soft and warm.

**Preparation of Soil.**—Turn over the earth to make it loose, rake it level with a wooden rake, and lay off the rows. Then take a piece of scantling six or eight feet long, and lay it along the line of the row. Tread this firmly into the soft earth, making a crease not over an inch deep. If scantling

is not at hand, the rake handle will do, though it does not give so much space for scattering the seeds. Sow the seed, three or four to the inch, in this crease.

Now press the earth down firmly above the seeds with the rake, or walk over the row. With the firm

PLANTING BEETS

Make the earth soft, then lay the strip of scantling, and tread it in, to make a crease an inch deep. Cover and make the soil firm.

bed made beneath the seed by pressing in the stick, and with the soft earth pressed firmly about it from above, the seed will not dry out if the weather is hot.

Before leaving the row, scatter just a little soft earth over it, or scratch the surface lightly with the rake. This leaves a thin dust mulch, which will keep the top surface from drying out and cracking.

**Width of Rows.** — If there is room in the garden, it is easier to care for the beets in rows about

eighteen inches apart. They may, however, be placed as near as ten inches, if care is taken in working among them.

## Culture

**Cultivating.** — As soon as the sprouts show plainly in the rows, begin cultivating. The wheel harrow will serve well, if the rows give room enough. Otherwise, the potato-digger or a small rake is needed. Keep the surface soil soft and fine, and work it over after every rain as soon as the surface moisture has drained away.

**Thinning Out.** — As the beets get large enough to pull for greens, thin them out, leaving them so that they do not touch one another in the row. By the next week they will have grown enough to be close together again, and another supply of greens may be pulled. Remember that the little beets now forming are the best part of the greens and should never be cut off.

It is not good practice to thin beets for the home garden so that they stand two or three inches apart in the row. That is necessary on farms, where the whole thing must be done at one operation. In the small garden, the beets should be thinned every few days so that those left do not quite touch one another. Thus one is provided with both greens and fresh beets as they develop in size, while at the same time rows are left intact, producing the maximum crop.

### Winter Crop

A bushel of beets in the cellar, to add their part to the New England boiled dinner through the winter, can be provided by planting a couple of rows early in July. When the cold weather approaches, pull them, cut off the tops, and pile them in the coolest part of the cellar against the wall. Then get some sandy loam and cover them, letting it work well down among the beets. Be sure that the spot where the beets stand is dry.

### Beet Enemies

There seems to be no important disease to protect beets against at present. Cutworms are fond of young beets, but there are usually so many plants that the harm they do is small. If cutworms are too numerous, sprinkle about some cutworm bait, made as follows: one half cup of arsenate of lead, mixed with two quarts of bran, and wet with water sweetened with molasses. There is a small white worm which gets into the leaves and spoils them for greens. This worm does little harm when the soil is well limed and rich; but if the soil is acid, and growth is slow, it may do considerable damage.

### Chard

**A Desirable Addition to the Garden.** — The broad leaves and thick, white stems of well-grown chard

would never lead one to suppose it was a member of the beet family; but the seed looks exactly like beet seed, and the young plants are also similar. This beet is not grown for the roots, but for the thick, white stems and broad leaves.

Until it is well grown chard may be eaten as a green, stem and leaf being boiled together till tender. When the leaves and stalks develop to full size, the leaves may be boiled for greens, and the stalks cut in pieces and creamed, or served with butter like asparagus. The flavor is somewhat like asparagus, somewhat like oyster plant. Chard gives such a constant supply of desirable food for the table that no garden should be without it. It is very easy to grow, having no disease and no insect enemies that are likely to do it much harm. A row of twenty feet will be ample for the ordinary family, as a few mature leaves make enough for one meal.

LUCULLUS CHARD, WELL FERTILIZED, MAKES WONDERFUL GROWTH

**Lucullus Chard.** — From the ordinary chard a new variety has been developed, which is far more productive than the common plant. This is called *Lucullus Chard.* It

grows to a height of two and one half feet and has thick, heavy, cream-white stalks. The leaf is deeply crumpled and free from fiber.

**Culture.** — Chard requires the same rich soil that other members of the beet family thrive in, and should be planted at the same time, when the ground is warm and the leaves starting on the early trees. Seed should be planted rather thickly in grooves made by pressing in the scantling or rake handle — about five seeds to the inch. As the plants grow, they may be thinned out and used for greens at any stage. When they approach full size, they should stand six or seven inches apart in the row. After that no more should be pulled out. The larger leaves should be cut, one by one, with a sharp knife, an inch or two above the root. New leaves will grow to take their places, keeping up a constant supply till frost.

# CHAPTER IX

## THE CABBAGE FAMILY

THERE are several branches of the cabbage family which are easy to cultivate in the home garden, easy to store, and very valuable as food.

This group includes the standard cabbage — early and late — in many varieties, the cauliflower, the most delicate and delicious member of the cabbage family, and Brussels sprouts.

### CABBAGE

The cabbage develops a compact head formed of the leaves, all of which is eaten except the outside leaves. In most parts of the country there is an early cabbage crop of varieties which are to be eaten at once and which cannot be stored long. Later in the season another crop is matured, which is stored for winter use. In the extreme South, however, the season for cabbage is so long that the early varieties may be seen growing almost every month in the year, as this is one of the hardiest plants and is little hurt by moderate frosts.

**Spring and Summer Cabbage.** — Several varieties of early cabbage have proved good for the home garden. The *Jersey Wakefield* has a long, successful record in all parts of the country, and it is recommended everywhere. It has a rather small, solid, pointed head. The quality is excellent.

The *Copenhagen Market*, introduced from the Danish peninsula, is now also receiving much attention. It is early, and develops hard, round heads of good quality. It is rather large for the average family, some heads weighing ten pounds, and the flesh is perhaps not quite so sweet and delicate as the *Wakefield*.

COPENHAGEN MARKET CABBAGE

One fault of both these is that, if they are left in the garden, the heads will split soon after they are ripe. This is unsatisfactory in the home garden; for one wants to have cabbages now and then, not all at once, and they cannot be pulled and stored long during the warm weather. This difficulty has been well understood by specialists, and a new cabbage, *Mainstay-Early*, appeared four or five years ago, which so far has stood the test of time very well

indeed. This cabbage has a small head, round and solid, weighing from two to three pounds. The flesh is white and crisp, similar in most respects to the *Jersey Wakefield.* The special value of the *Mainstay* lies in its keeping qualities. It will stay in the garden two or three weeks after maturity without splitting, and can be used for the table when desired.

**Planting Seed for Early Cabbage.** — The plants for early cabbage should be ready to set out in the field as soon as the ground is warm. They suffer little from cold; but there is no real advantage in transplanting them while the ground is cold and soggy, as there will be no growth under such conditions. In order to have sturdy plants ready for setting out, prepare window boxes, or a space in the cold frame, at least a month before the plants will be needed. Have rich, light soil in the window box, three inches deep. Make holes with a match about one fourth of an inch deep, an inch apart, and drop two seeds into each hole.

Cabbage seed sprout quickly and are usually of vigorous growth. Where two sprout in the same spot, it is better to cut one off. This gives the root of each plant a chance to grow unhindered and develop its full strength. If the young plants are left close together, they will shoot up tall and spindling, with little strength of root or stalk. Be sure that free drainage is provided for all surplus

water, as too much water will have the same effect as crowding. Everything possible must be done to make the plant sturdy.

**Hardening the Young Plants.** — As the weather will still be cool when the cabbage plants are set in the field, it is necessary to prepare them for their new home. To take plants from a window box, where they have had steam heat and protection from all cold, and put them into the field suddenly, where the night temperature may come dangerously near the frost line, is rather too much even for cabbages. As the time approaches for setting out, place the window boxes outdoors during the daytime and raise the covers of the cold frame. This will prepare the plant a bit for its new environment and check its tendency to send up long, frail leaves.

**Soil and Cultivation.** — To get the best results, the soil for cabbage should be rich and worked over till it is loose and fine. Nothing seems to do quite so well as rotted dairy or stable dressing. If this has been worked into the soil the fall previous, the ground will be made perfect by scattering along the rows a complete commercial fertilizer, two or three pounds to each one hundred feet. If the dressing cannot be obtained, use about five pounds of commercial fertilizer to a one-hundred-foot row, and work in well at the time of planting. Then work in two more applications of two or three pounds each while cultivating the growing crop. Be sure that

the soil is prepared a week or so before setting out the plants, so that it may be loose and fine.

**Setting Out.** — When the plants are ready for the field, measure off the rows with the garden line, letting them run about two feet apart, and plan to have the cabbages about eighteen inches apart in the row. Dig holes with the trowel four inches deep, and remove sticks and stones so that there will be nothing but soft earth about the roots. Pour into these holes enough water to make the earth moist, but not muddy. Set the roots of the plant so that they will be well spread out, a little deeper than they were in the seed box. Two inches should be deep enough, but if the plant is tall it may be set three inches deep, not more.

Some people use a dibble, or round stick, to make the holes in setting out the young plants. This is not so desirable as the trowel, for the inexperienced gardener. There is constant danger of getting the roots bunched together and damaged, in thrusting them into the small holes. By opening a larger hole with the trowel, one makes sure that the roots are well spread out and free from objects that may obstruct their growth. Before putting into the ground, trim off two or three of the outside leaves.

**Late Cabbage.** — The *Danish Ball Head* cabbage is the leading variety for winter use in America. This variety was perfected by the Danes, who lead the world in cabbage growing and supply most of

the seed for this country. It forms very heavy, solid heads, which develop well in cool climates, and keep all winter. It is, however, rather lacking in tenderness and delicate flavor.

Savoy Cabbage

There are other varieties of fine quality, which develop solid heads and keep well. Among these, the *Savoy* cabbage will give the home gardener great satisfaction. It has a solid head of delicate, white flesh, and is free from the pungent flavor rather common in cabbage.

**Planting Late Cabbage.** — For winter cabbage, the seed may be planted during June in a prepared seed bed, or in the open field. If the ground is not occupied by other crops when the time for planting comes, it is best to start the seed in the place where the plants are going to stay. In the early spring there is little trouble in transplanting; the weather is cool and rains are frequent. In midsummer, conditions are very different. The earth is hot and the sun is hot; the weather may be hot and dry for several days together. Under these conditions it is not easy to transplant even cabbages, and

give them a good start. If they are already well rooted in their permanent location when the hot days come, they are indifferent to a drought and keep right ahead.

If you plan to leave the plants where they are sprouted, measure the rows three feet apart for the large, late varieties, and plant four or five seeds in each spot, a half inch deep and an inch or so apart. These seed groups should be two feet apart in the row. When the seeds sprout, thin them out, finally leaving the strongest plant at each spot.

If on the ground you are to use for late cabbages you have peas and other plants to be pulled out in July, plant the cabbage seed in a small space, well enriched and worked over carefully for a seed bed. Do not sow too close; sow thinly, a half an inch deep, and an inch apart. Plan to have enough seedlings to replace those which are lost in transplanting. Don't forget the importance of giving the young plants plenty of room, and of transplanting them before they get tall and spindling.

When the plants are firmly rooted in the rows, cultivate carefully and keep cultivating till fall. In planning the cabbage crop, remember that the ordinary family will not eat more than one good head a week, on the average. Thirty or forty heads should make an ample supply.

**Cabbage Enemies.** — When the first leaves of the cabbage develop, it frequently happens that a

small black fly appears also. This may be kept away by dusting the plants early in the morning, before the dew is off, with wood ashes, tobacco dust, or fine, dry plaster. Do not put much on at one time. If it cakes on the leaves, it will fill up the pores and do a good deal of harm.

As the cabbage is "heading up" and the use of poison is discontinued, the stray worms may easily be picked off by hand.

During warm weather, the louse may also attack the cabbage plants. He gathers in little green clusters near the base of the leaves, and sucks the sap that should go to the growing plant. Poison will not do him much harm, because he does not eat the leaves. He thrusts his little beak down into the veins of the plant, where poison does not go. Persian insect powder, blown among the leaves or sprayed on with water, will kill these lice. Kerosene emulsion or whale-oil soap will also keep them away.

The fly and the louse will prove only occasional disturbers in the cabbage patch, but the little green cabbage worm is almost always on hand and has

his best appetite with him. This green cabbage worm came from Germany some years ago, and his one ambition is to swallow everything in sight. The cabbage worm grows very rapidly, and soon fills his skin so full that it cracks and peels off, while he crawls out in a brand new skin, much larger than the old one, ready for another feast of cabbages.

Fortunately this ravenous creature is easily controlled. Spray the plants with Pyrox, or arsenate of lead, and that will be his final feast. There is little danger from using this spray, as the heads expand from the growth of the inner leaves, and the leaves sprayed during growth will not be eaten. It would not be wise, of course, to spray just before gathering; but this is not necessary, as the worm can do little harm to the grown plant, if it has been well sprayed when growing. We might add that the pretty, little yellow butterfly is the mother of all these green worms. The more yellow butterflies you catch, the fewer green worms will be left to eat cabbage.

**Clubroot.** — A disease called clubroot often destroys cabbages, and when the plant is once infected there is no way of curing it. The roots become enlarged, and the plant becomes stunted. The best way to fight clubroot is to change the cabbage patch each year, and also the seed bed. The germs of the disease linger from year to year, and may attack new plants growing in the same spot.

One might suppose that, with all these enemies in the path, the way to a successful harvest would be beset with dangers; few gardeners, however, will experience much trouble in getting a good crop. The cabbage fights hard for its own existence and, with a little help, will thrive and develop safely.

**Storing Winter Cabbage.** — If there is a furnace in the cellar, it is quite likely that the cellar will be too warm and dry to keep cabbage. If there is a room away from the furnace, it may be satisfactory to pack the cabbages in barrels there. Do not cut off the roots. Leave a few outside leaves to protect the head, and pack closely together, roots up. Cover the barrel with a bag to keep out the air.

It is not difficult to store them outdoors. You may sink a barrel or box in the ground, below the frost line, and put the heads in that, covering with straw and earth. Keep out water as well as the cold.

Where you have a fair number of heads, it is more practical to make a long pile of them and cover them with earth. Trim off the outer leaves, lay them, roots up, in a row, three wide at the bottom and two on top. Then pile fine, loose soil over them, working it well in between the heads. Be sure the place where they stand is drained, so that water will not lie about them. Over the earth, which should be at least a foot thick in cold climates, pile straw or corn fodder, which will keep the earth from freezing very hard.

## Cauliflower

Cauliflower is not so easy to raise as cabbage, but it is so much enjoyed by most people that the extra effort to grow it is well worth while. For this plant, the soil should be very rich and well filled with humus, as success depends upon a constant supply

Snowball Cauliflower

of moisture at the root. In fact, the average gardener has not had much luck in getting good heads of cauliflower, chiefly for lack of the proper amount of moisture.

**Varieties.** — Lately a new variety has been developed in Denmark, the home of almost all valued members of the cabbage group, which forms good heads under the conditions which prevail in the ordinary American garden. This variety, called the *Dryweather* cauliflower, is especially recommended

for that reason. Other good types are the *Erfurt* and the *Snowball*, which produce well if given expert care.

**Culture.** — As the hot, dry weather of the American midsummer is likely to spoil the heads which are forming at that time, it is better to plant rather late — some time in June. Then the heads will not be forming until the hottest days are passed, and they can get the benefit of the cool autumn rains. Another good reason for delaying this crop is the generous menu provided by the ordinary garden in midsummer. There is no lack of fresh vegetables then, but in the fall the addition of a new dish like cauliflower will be welcome.

Cauliflowers may be planted by the method used for cabbage and may be transplanted in the same way. The seed, however, is very expensive, and every care should be taken to waste none of the young plants. Though the seed is small, it sprouts quickly and has strong growth; so no fear need be felt in planting it in the garden, a half an inch deep, if the soil is well worked and fine. Set the plants two feet apart in the rows. They need the same space as large cabbages.

When the white head begins to form, gather the leaves together, so that they will protect it from the sun and wind. Tie them in place with a soft string. Do work of this kind in the afternoon of a fair day, if possible. In the morning or on wet days, the

leaves are likely to be full of sap and brittle. In that condition they will break, if bent over very much.

Cauliflower cannot be stored very long, as cabbage can. The delicate white flesh will become discolored, and the flavor will grow rather strong. It will, however, stand the cold; and the heads, if covered well with the leaves, continue to grow in the field after some nights of sharp frost. There is no need to take them in until the weather is actually freezing. If the heads begin to spread apart, pick them at once, as they will soon spoil.

**Enemies.** — Cauliflower suffers from the same enemies that attack cabbage, and it can be protected in the same way. The poison, however, should not be continued long after the head begins to form, as it would be likely to work inside the leaves. What few worms appear after that can be picked off before they have done much harm.

### Brussels Sprouts

Brussels sprouts are really tiny cabbages which grow clustered about a heavy stalk. Each develops a little green, compact head, about as large as a tulip bulb. Brussels sprouts are planted and handled the same as cabbages, and need the same room in the garden, about two feet, in rows two feet or more apart.

The young plants are a bit more delicate than the

Brussels Sprouts

cabbage plant but, when mature, even severe cold does them little harm. Except in the extreme northern states, they may be left in the garden till Christmas, and cut off as needed. The best way to prepare them for the table is to boil them till tender, and serve with butter and salt, or vinegar. There is little profit for the amateur in growing sprouts to sell. For home use, the late planting is the best; as sprouts from seed planted in June will mature when other vegetables are going by in the home garden.

The sprouts come mostly at the base of the heavy leaves, which grow along the stalk. If these leaves are carefully pulled off, nearly up to the top of the stalk, it will give the little cabbages a better chance to develop.

## Kohl-Rabi

Kohl-rabi is a member of the cabbage family which has a habit of growth much like that of the

turnip. The edible part is a bulb which forms on the stem just above the ground.

This plant is little known as yet in America, and few have tasted it at its best, because the ordinary kohl-rabi found in the markets is overgrown and tough. If it is planted in rich soil, grown quickly, and picked before the skin gets tough, it is very delicate and desirable. It matures quickly, however, and soon becomes tough, coarse, and stringy.

**Varieties.** — The *Vienna* kohl-rabi, both the white and the purple, is widely used for domestic food. The *White Vienna* is about two inches in diameter when at its best stage, and a pale green color. The *Purple Vienna* is larger, has a dull red, or purple color, and matures a bit later.

**Culture.** — Plant in drills two feet apart or in a seed bed, and handle like cabbage, setting out in rows two feet apart and six or eight inches apart in the row.

Several plantings should be put in if kohl-rabi is desired at its best. The first may be as early as for peas or cabbage, and successive plantings may be made every two weeks.

Kohl-rabi may be stored for winter use like turnips, and for that purpose should be planted late in June or early in July.

# CHAPTER X

## CARROTS AND PARSNIPS

### Carrots

As will be seen in the illustration, carrots may be had in several different shapes, from the *Golden Ball* to the *Long Orange*. Where the soil is partly clay and tends to become hard, the short varieties are to be chosen. The long types succeed only where the soil is deep and light. As the average family does not eat many carrots, and as they do not vary greatly in quality, one or two types for a season should be sufficient. A fifty-foot row of the large varieties will provide enough for the table during the summer and leave a store for winter use.

**Types.** — The small round carrots, illustrated by the *Golden Ball*, are the earliest. They are easy to grow and hardy. When mature they are about an inch and a half in diameter.

The *Early Scarlet Horn* is not quite so early as the *Golden Ball*. It averages three inches long and is about as large at the bottom as at the top.

A little later still comes the *Oxheart*, three inches long and slightly tapering. This is a very profitable

variety for the home garden, as it grows well in various soils and locations and produces heavy crops.

The *Chantenay* and *Long Orange* are late varieties, shaped as in the illustration. The *Long Orange* does well only in light, porous soils.

The *Danvers Half-long* carrot is probably grown by market gardeners in this country more than all the others put together. Its habit of growth adapts it to almost all soils, and it produces wonderful crops if given good soil and good treatment.

**Planting.** — The soil for carrots must be prepared, in general, the same as for beets, though it is possible to get fair carrots from soil where beets would not do well. Work it over thoroughly in the fall with two or three barrow-loads of dairy dressing, if possible. If commercial fertilizer must be depended on, dig five pounds to the fifty-foot row well into the earth, shortly before planting.

Carrots may be planted as soon as the soil is loose and warm. The seeds are very small, but they come up with astonishing vigor if the bed is well prepared. The rows may be from one foot to three feet apart, according to the space you have and the method of cultivation you wish to use. When the soil is loose and fine, lay off the rows and make a crease in the earth by pressing in a piece of scantling or the rake handle, along the marking line.

Carrots may be left close together and then pulled as they increase in size.

In this crease, which should be about half an inch deep, scatter the seeds thinly, four or five to the inch. With the garden sieve, sift enough rich, light soil over the seeds to fill up the groove. Press this down firmly to make a snug bed of earth. Then sift a little soft earth above it, to keep the surface water from too rapid evaporation.

**Culture.** — When the carrots are an inch high, cultivation should begin. Take care to avoid covering the slender plants with dirt. At three

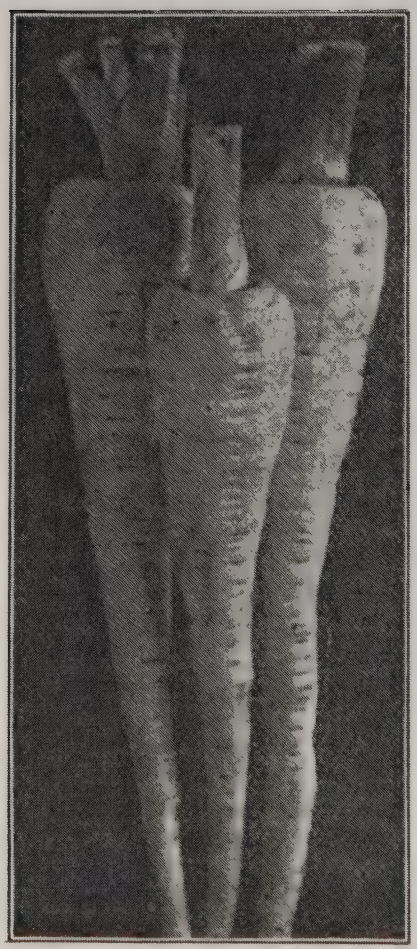
inches they should be thinned out so that they stand an inch apart, or a little less, and the ground about them should be worked over carefully with a trowel, to keep it soft and free from weeds. About this time it is advisable to scatter a pound or two of fertilizer along the row, to keep the growth steady. As soon as the plants begin to touch each other, the larger ones may be pulled for table use. Keep thinning in this manner during the summer, and you will find that the row is practically full when the time comes for fall digging.

As cold weather approaches, dig out the carrots with the spading fork, working at right angles to the row to avoid bruising the roots. Put them down cellar, in the coolest part, and cover them with light, sandy loam.

**Hostile Worms.**—Cutworms sometimes deal havoc in rows of carrots. They are especially active if the weather is hot and dry. If they appear in force, use the cutworm bait, made from bran and arsenate of lead. A brilliant worm in yellow and black appears on the carrot tops in summer. The worst thing about it is the smell, as it does not hurt the crop much under ordinary conditions. Do not catch it in the bare hands, however, as it gives off a brown fluid that smells for a week. Knock it off with a stick and step on it.

## Parsnips

**Parsnip Seed.** — Parsnips are easy to grow and care for when they are once well started. Well begun is more than half done with parsnips. The seed has little vitality at best, and, unless it is of the very first quality and fresh, it probably will not have strength enough to sprout. Some kinds of seed, if they are not all used, may be kept over for the second season and give good results, though this is not recommended. Parsnips, however, should always be purchased fresh each year from a seed house which thinks too much of its reputation to sell last year's seeds.



Hollow Crown Parsnips

**Varieties.** — If you have no spot in the garden where the soil is a foot deep, fine and loose and full of humus, the wisdom of trying to grow the common, *Hollow Crown* parsnip at all is doubtful. This parsnip has a long, tapering root.

If there is any clod of earth or stone in the way, it will separate into several small roots and be of little value. Fortunately there is a different type, the *Offenham Market* parsnip, which will do well in the average soil. The *Offenham Market* parsnip is shaped a good deal like a boy's top. It has a heavy shoulder, being frequently three inches across at the top, and its short taproot has no difficulty in developing in ordinary soil. The flesh is not white like that of the *Hollow Crown* variety, but of a butter color, and it is heavy in sugar. Even the large specimens, weighing well over a pound, develop without tough cores. Easy to prepare for the table, with little waste, this parsnip has everything to recommend it for the small garden. Parsnips may be boiled and served with butter or cream; they may be mashed like turnip; or they may be roasted with meat in the oven.

**Preparation of the Soil.** — Soil for parsnips need not be so very rich, as they have all the season in which to grow, and it is possible to make them coarse by overgrowth. The soil must, though, be soft and deep, free from stones, and well turned over.

A couple of barrow-loads of dressing worked into a fifty-foot row the fall previous, or eight pounds of complete commercial fertilizer dug in shortly before planting, will be sufficient, if the soil was previously in good condition.

**Planting.** — In planting parsnips one has to choose between difficulties. If the seed is put in too early, the cold earth above it may hold it under till it rots. If one waits till the earth is thoroughly warm, as one does for carrots and beets, a warm, dry spell may shrivel the seed and thus end its young life. The safest plan for most localities is to plant parsnips about a week before you intend to put in beets and carrots.

Dig the row over thoroughly with the spading fork and rake it level and free from lumps and stones. Then make rows eighteen inches apart and, with a sharp stick, open a furrow about one inch deep. Into this drop at least two seeds to the inch and draw the earth back firmly about the seed, preferably with the hands. Rake over the top of the row carefully with the wooden rake, after sprinkling two or three handfuls of commercial fertilizer above the seed to help it start. If the season is dry, the row should be thoroughly watered at least once a week if it is possible to do so. It is better to water well once a week than lightly twice a week. The rows will probably need cultivation before the plants show clearly. A few radish seeds, dropped here and there in the row, will sprout quickly and serve as a guide in cultivating.

The first leaves of the parsnip are light green and shaped like the first leaves of the beet. They resemble very much the weeds about them. The

later, or true leaf, can be easily recognized. It is shaped like a palm leaf fan, with sharply notched edges. Nothing else in the row will be likely to resemble it.

### Special Methods of Planting Parsnips

If the ground where parsnips are to be planted is weedy, and the seeds are likely to be choked, it is possible to sow the seed in the cold frame, and then transplant to the rows. The long root makes it easy to get them started in the new ground.

Be sure that the earth is soft and turned deep. Then drive the bar down six or eight inches, making the holes four inches apart. Fill the holes with water. When it has soaked in, set the parsnips carefully in the holes. Be sure that the fine end of the root drops straight down its entire length, and that the moist earth is gathered firmly about it.

Gardeners of long experience get fancy parsnips by preparing the earth beneath the roots with a bar. When the row is spaded and made fine, they drive deep holes with a crowbar, four or five inches apart. These are then filled with fine, rich earth. At the top, the seeds are planted, two or three to the hole. As the long taproots go down, they find the passage clear below them, and extra smooth roots are the result.

**Culture.** — When two inches high, parsnips should be cultivated carefully with a trowel and all weeds

removed, while the plants are thinned to stand three inches apart in the row. They need no further care, except cultivation, to ripen the crop, and there is no disease or pest which greatly disturbs the parsnip. If the web-worm appears, a spray of arsenate of lead will dispose of it.

**Storing.** — When fall sets in, dig what parsnips you wish to use before the ground thaws in the spring, and put them down cellar. Cover them with earth near the carrots and beets. The rest may be left in the ground and will be improved in flavor after a winter in the garden. Be sure that water does not stand over the row, so that it will freeze and thaw near the parsnip tops, as it will rot them. A thin mulch of leaves, directly over the row, will shed the water.

All parsnips left in the ground should be dug as soon as the earth thaws in the spring, as they soon sprout and become unfit for the table. Roots left in the garden will grow a great many seeds which will be scattered about by the wind; these, now that you don't want them to, will sprout freely and interfere with other crops. Parsnips growing wild this way are considered poisonous.

White Plume Celery

# CHAPTER XI

## CELERY

Have you a damp spot in the garden where a drain runs out, or a low piece which is moist but well drained? If you have, you can grow good celery there. It is not difficult to produce the best of celery, if the land is rich and moist, but there is little hope of a crop if both these conditions are not present.

### Celery Types

Each year the problem of celery growing becomes easier for the amateur. Formerly this crop required long, patient attention throughout nearly a year. The seed was sown in February, and the crop finally stored away late in the following fall. New types,

however, have been developed, which mature more rapidly and require much less care than the late varieties formerly grown.

**White Plume.** — One of the most hardy and earliest varieties of celery is the *White Plume.* It may be planted in the cold frame in April and will be ready for the table by the last of August. It is popular in many places because it is handsome and easy to grow; but it has a flavor which is likely to be strong, except under the most favorable conditions.

**Paris Golden Self-Blanching.** — Another type which is equally hardy and nearly as early, with a superior flavor, is the *Paris Golden.* This variety of celery has large, sturdy, brittle stalks of excellent flavor and of a light yellow color. The term "self-blanching" does not mean, as one might suppose, that the celery blanches of its own accord; it means that it blanches quickly and easily when properly protected from the light and air.

**Boston Market.** — We often see bunches of rather short, stubby celery stalks in the stores, and are surprised to find that these cost more than other far more handsome bunches about them. This is *Boston Market* celery, the most delicate and most approved celery for the table. It requires a good deal of care to bring it to perfection; but it is worth the trouble if one is in a position to take some extra pains with this crop.

**Giant Pascal.** — For the ordinary garden, *Giant Pascal* constitutes perhaps the most satisfactory late variety. It is of stocky growth and forms large bunches of thick, brittle stalks, which keep well till late into the winter.

## Method of Garden Culture

For the beginner with small facilities for planting early seeds, the celery plants which are for sale in all seed stores during late June and early July make the easiest and most practical start for the crop. Celery seed is very small, delicate, and slow to germinate. If the gardener wishes to grow his own plants, however, the following directions will probably bring success if carefully followed.

**Celery from Seed.** — In March, prepare a window box with three inches of sifted, rich soil. This soil must be light and full of thoroughly rotted dressing. Earth which packs down when wet will not do. Moisten this soil, after it is smooth and firm in the box. Then make creases across the box three inches apart, by pressing in a stick about as large as a pencil. These grooves should be no deeper than half the diameter of a pencil.

Sow the seed thinly in these creases, five or six seeds to the inch. Then sift over them just enough of the lightest soil to cover them. This soil must be kept moist, but do not use enough water at any one time to wash the soil away. A good plan is to lay a

piece of rough cloth over the earth and water that. It may be left on till the seeds germinate.

**Transplanting.** — Celery should be transplanted twice. As soon as the young plants are large enough to handle, they should be transplanted to another box or to the cold frame, where they should stand two inches apart each way. Again, when they are four or five inches high, and warm weather has come, they may be set in the garden.

TRANSPLANTED CELERY PLANT

Unless celery is transplanted, it grows into a very different plant from that usually seen. Instead of the thick nest of roots, it develops a thin taproot that has little strength to support the plant; and in place of a large bunch of heavy stalks, it produces a thin, poor group of tough stalks, which are very slow in developing.

**Setting Celery in the Garden.** — When the plants are large enough to set out in the garden, scoop out shallow trenches four or five inches deep, piling between them the earth that is removed. The trenches will need to be three feet apart in order to allow space for handling this earth. Four feet be-

tween them will not be too much if there is plenty of room in the garden. In the bottom of the trench, work in two inches of well-rotted dairy dressing. Mix the manure with the soil very thoroughly.

Set the plants carefully in the bottom of the trench, six inches apart. Open a hole with the trowel large enough to accommodate the whole root without any crowding.

**Importance of Plenty of Water.** — As soon as the plants are set, they must be watered. Of course water must not stand about the roots; but the earth may be kept moist all the time without harming the celery. Planting in trenches makes it possible to use a little water to very good advantage, as it cannot run off into the surrounding land. If it is possible to lay a few irrigation pipes in these trenches when setting the plants, a constant source of water will be supplied to the roots.

**Banking.** — As the plants grow above the top of the trench, the earth should be drawn back gradually till the ground is level once more and six inches of the stalk is covered with earth. Later on, when the plants stand eight or ten inches above the level, more earth should be drawn about them.

Work about the celery plants when the earth is dry, as wet soil is hard to handle and may turn the stalks yellow. When banking the stalks, gather the tops carefully in the left hand, holding the stalks close together. Then draw up the earth with

a trowel, till the branches are covered up to the top leaves and held firmly in place. Later banking, as the stalks grow higher, may be done with the hoe, as the earth will keep the stalks together.

## Diseases

Celery is quite free from diseases and insect pests in most localities and in most seasons. There is a blight which attacks the growing plants sometimes. The best plan is to plant the hardy varieties which have proved able to resist the blight, or, if necessary, to spray with Bordeaux mixture, which will hold it in check.

Boston Market Celery

## Storing Celery

The early varieties, *White Plume* and *Self-Blanching*, do not keep very long, though with care they should stay in good condition till Christmas. *Pascal* and *Boston Market* will keep all winter. When cold weather comes, take the bunches from the rows carefully, with a spade or

shovel. Loosen the earth beneath the roots, so that they will come away unimpaired. Pack the bunches close together, upright in a box, and place in a cool cellar, covering them with fine earth up to the branches.

If this earth becomes dry, the stalks will shrivel, but you must not water the leaves and stalks or they will rot. A few holes may be bored, low down in the box, and water may be poured in by tilting the box over to one side. This will moisten the earth without wetting the leaves.

A School Garden of One Eighth of an Acre

# CHAPTER XII

## SWEET CORN

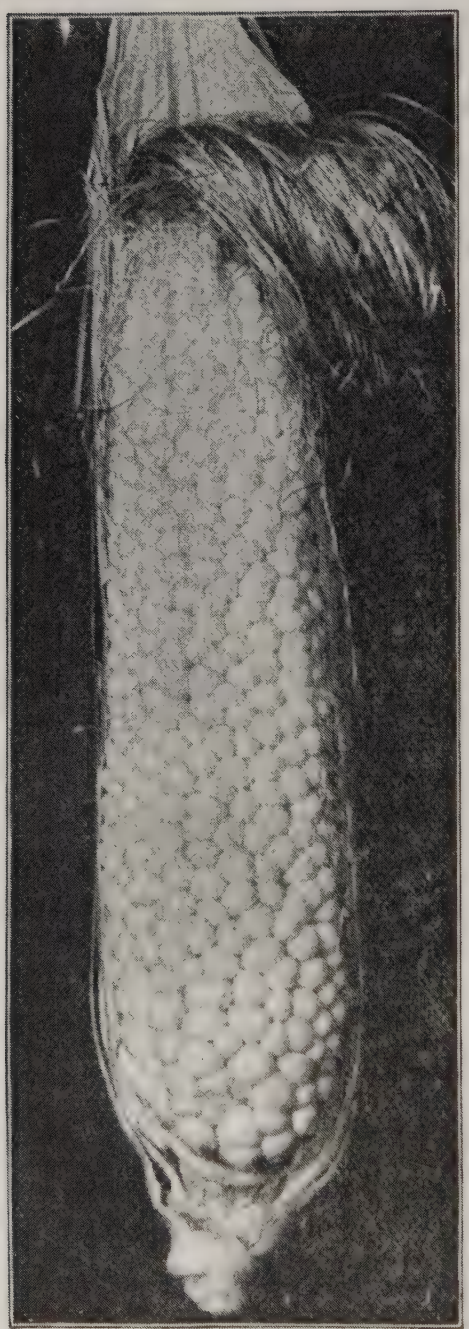
SWEET CORN takes more room in the garden, for the amount of food it produces, than any other plant which the amateur is likely to cultivate. At best, one cannot get more than about eight ears to a hill; and the hills need to stand at least three feet apart when producing at that rate. Nevertheless, every effort should be made to grow as much sweet corn as the garden can possibly accommodate, for it is safe to say that no one knows the real qualities of this vegetable until he has eaten it fresh from his own garden. Gathered while the dew is still wet, and kept cool till dinner time, it more than pays for the toil expended upon it and the room it takes.

### KINDS TO CHOOSE

**Golden Bantam.** — It is fairly easy to choose the first corn for spring sowing in the home garden, for the *Golden Bantam* has today out-distanced all competitors. There are several varieties of corn which ripen earlier than the *Bantam*, but if one will compare them as to quality, he will be only too

When pearls of dew are on the blades,
And russet tassels greet the morn,
Then wander through the glistening glades,
And pick the corn.

glad to wait a few days and have the *Bantam* corn. Since corn takes a great deal of room and requires some care, it seems unprofitable, where room and labor count, to plant the commonplace when the best is at hand.



COUNTRY GENTLEMAN CORN

*Golden Bantam* is a pale yellow when ready for the table, deepening to an orange yellow as it matures. Its flavor so far surpasses that of other corn, that many grow nothing else for the home patch, planting for several crops, a week or two apart. The stalk is short and slight and bears usually two ears, one good ear and another rather smaller. There are now many strains of this corn offered by seedsmen. The general effort is to produce a larger ear which will retain the flavor of the *Bantam*. At present, it looks as if this effort would be successful.

**Later Varieties.** — After the *Bantam* corn come many varieties, which ripen in their

season. By choosing well, one may plant all his corn in May and have it ripen week by week, from the last of July till September, according to variety. Then a last planting of an early sort, like the *Bantam*, about the fourth of July, will give one more picking after the late May-planted varieties are finished.

*Crosby*, a second early, large, white corn, is a favorite everywhere. *Potter's Excelsior* and *Country Gentleman* are excellent later varieties of strong growth. *Country Gentleman* has uneven rows of very deep, sweet kernels; but it passes its best stage rapidly and soon becomes rather tough. For a last sowing, *Stowell's Evergreen* is a variety which ripens in early September throughout the northern states. Its habit of ripening gradually makes it especially worth while for the home garden.

## Planting Corn

**Inadvisability of Starting in Cold Frame.** — A good many articles on corn planting speak of starting the seed in window boxes and cold frames and then transplanting to the field, but it is hard to see much use in this, for several reasons. Early corn does not tend to rot in the ground so much as beans do, if the weather is wet and cold. The sprout is fully as delicate as the seed, and if the weather is safe for the corn to appear above ground, it will usually do so. If set out, the small blades are very

sensitive to cold; and even if set expertly, they will lose strength at the slightest chill and be slower than field-planted corn, put in later. Besides this, only the most expert can transplant corn. From the nature of the root growth, one can see that it is a delicate operation to get those hair roots from one bed of earth into another without damage. Any one interested may try it, but good results are hardly to be expected.

**When to Plant the Early Crop.** — For the first early crop, it is safe to put in the seed as soon as the first green appears on the trees. See that the earth is worked over well and fertilized somewhat. The first application need not be very heavy. If stable or dairy dressing has been plowed in, that is a good preparation. Satisfactory results will be obtained if ten pounds of complete commercial fertilizer to each twenty-foot square is scattered about and raked in at planting. As the roots are feeding near the surface, the fertilizer need not be worked deep into the soil. Poultry droppings are especially good for corn. A barrow-load to each twenty-foot square is good for a start.

**Rows or Hills.** — There are two distinct methods of placing the corn in the field. It may be placed in hills, two or three feet apart each way, or it may be planted in rows, about three feet apart, leaving the stalks eight or ten inches apart in the row. Gardeners get good results either way, and some very

successful growers use the latter method. However, a consideration of the root habit of corn, and of the advantage in ease of cultivation, would swing the balance in favor of the " hill " method, for the home garden.

Let us state here that when " hills " are spoken of in garden books, a real hill or round of earth is frequently not intended at all. It really means a spot where a group of seed is planted, and where the earth is prepared especially to receive them. No progressive farmer today piles up banks or mounds of earth about his corn. He measures off the spots where the seed is to be planted, hoes out the stones, and that spot is called a hill.

It is much easier to make use of a stony piece of ground by preparing hills three feet or so apart, than by preparing rows; and corn will do very well on a stony piece, if it is thoroughly harrowed.

**Pollen and Its Work.** — Another consideration of importance here is the pollen and its work. The pollen of the corn is made in the feather-like blossoms at the top. Just at the time when the silk in the ear is at its best, the pollen ripens and falls from the top blossoms in a fine yellow dust. Every grain of corn in the ear has a thread of silk running from it to the outside air. If the pollen falls upon this thread, the kernel of corn develops. If pollen does not reach the thread at the right time, the kernel at that point on the ear does not develop. One

often finds ears of sweet corn with several kernels missing; sometimes half the ear is not filled out. In certain cases, where the silk has been hurt or taken away, no kernels develop.

The pollen drops from the blossoms above to the tasseled silk, as it appears on the ear.

Now, if we have a long row of corn, and a spell of windy weather comes about the time the pollen is dropping, it is clear that most of this pollen may be blown to one side; consequently the ears will be poorly developed. If the corn is planted in a compact group, the pollen which is scattered from one stalk will fall on its neighbor, adding much to the prospect of good ears.

**Danger of Mixing Varieties.** — This leads to one more hint. As this pollen flies so easily from one plant to another, any special variety of corn you wish to preserve must be kept by itself. Many managers of large

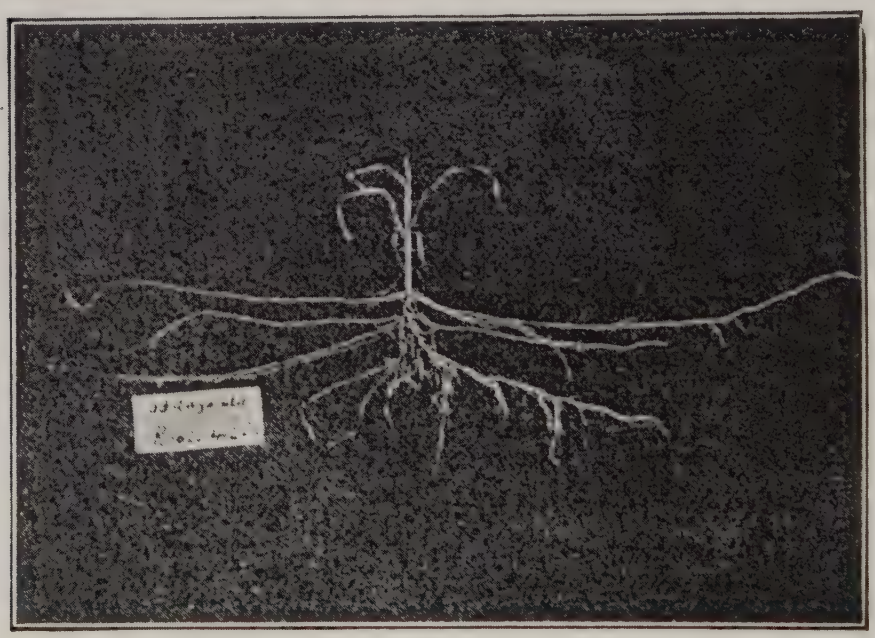
canning factories provide corn seed free to those who grow corn for them, rather than let the farmers try to save their own seed, and thus run a chance of getting it mixed. Different varieties of corn, grown together, will surely mix, and it would not be wise to save such seed. This is true of many garden plants. There is little seed from the garden that can be used to advantage. Beans and tomatoes are notable exceptions to this rule.

**Depth of Planting.** — Corn should not be planted over an inch deep, unless the soil is very light and tends to be dry. For the *Bantam* corn, make hills two and a half feet apart; for the larger sorts, at least three feet. Scoop out the earth an inch deep with a hoe and drop about ten kernels, leaving half an inch between each seed. Then cover with the hoe and make the earth firm. If this is early in the season, and frosts are still possible, a wise gardener will go over the row ten days later and drop a half dozen kernels next to each hill. Then if anything happens to the first sowing, the other one is ready to take its place.

## Cultivation

**Habit of Growth.** — In handling sweet corn one will have much greater success if he understands a little about its habit of growth. As soon as the sprout appears, long, threadlike roots run out in all directions, an inch or two under the surface; while

one large root, the taproot, leads down from the point of the kernel, often deep into the ground. These surface roots are, at some stages of growth, larger than the sprout, and will at all times, under favorable conditions, be fully as long as the stalk above



CORN ROOTS ONE MONTH AFTER PLANTING

These roots run out forty-two inches from the stalk, about three inches under the surface. Deep cultivation will injure them. This picture shows in a remarkable way how corn roots range for their food.

them. These delicate surface roots are hunting everywhere for food, often six or seven feet away from the parent stalk which they are providing with nourishment.

Knowing this about these roots, one may be sure that all the food supply in the corn patch will be

used, if the earth is kept in proper condition. There is no need of putting fertilizer near the hills. In fact, to encourage this root network to spread, it is better to scatter it about in the rows rather evenly. Potatoes, beans, peas, cabbages, and many other plants like to have their main food supply near at hand, but corn has a different habit.

The fact that these roots lie just below the surface warns us also that corn must not be cultivated too deeply, just an inch or two. At the same time, the earth must be kept soft and mellow always, or the sun will bake the ground and rob the roots of their nourishment.

CORN IS NOT JUDGED BY THE HEIGHT OF THE STALK

The plant on the left is heavier and better than that on the right.

**Thinning Out.** — As the sprouts get up a couple of inches, begin to thin them out, planning to leave not over four of the *Bantam* varieties or three of the large corn, in each hill. Leave an extra sprout until the plants are a foot high in case some may be hurt or eaten. In thinning the sprouts, give a sharp pull away from the hill, to avoid lifting and loosening the soil about the other roots.

**Fertilizing.** — When the corn is well started, an application of commercial fertilizer, about two pounds to the twenty-foot square, or nitrate of soda in about the same quantity, will keep up the growth. This should be done again later on as the ears are filling out, to insure a constant supply of nourishment for the growing crop. If you have poultry, nothing is better for growing corn than to scatter about the droppings whenever the roosts are cleaned.

TAKING SIDE SHOOTS FROM SWEET CORN

Bend down the shoot, turn it sideways, and pull it off clean.

**Side Shoots.** — When sweet corn gets about two thirds of its growth, distinct side shoots appear near the root. No ears will develop on these; and they will rob the bearing stalks of much needed nourishment if they are left. As the stalks near maturity, go through the rows once or twice and pull away these side shoots. Be careful not to drag on the roots in doing this. A sharp downward pull will strip them clean away. If necessary, hold the main stalk with one hand

while taking off the shoot. The ears grown on stalks treated thus are much superior to those where the side shoots are allowed to grow.

## Corn Enemies

**Smut.** — Corn has no disease that causes much trouble in the garden patch, except smut. This appears in large bunches about the stalk, with silvery skin and black contents. It is common in most places, but seldom is so prevalent as to do great harm. As the smut appears, it should be cut off and burned, as it will be likely to spread if left about.

**Cutworms.** — The cutworm may, if the season is hot and dry, do a great deal of damage to the young corn, one worm cutting down several stalks in the same night. Cutworms are about an inch long and have a brownish gray color. They are seldom seen above ground in the daytime, as they bury themselves half an inch under the soil when morning comes. When a young plant is found cut off just above the ground, by digging up an inch of the soil you will be likely to find the worm within a few inches of the injured plant.

If a piece of ground is infested with cutworms, the safest method is to mix a half cup of arsenate of lead, in powder form, with two quarts of bran. Then wet the whole with water sweetened with molasses, and drop in spoonfuls about the rows of young

plants. The worm much prefers the sweetened bran, but one meal is always enough. Apparently, birds, dogs, and cats know that this is poison, for there is no record at hand to show any danger from its use in this way.

**Corn Worm.** — There is also a corn worm, a lively fellow, with brilliant yellow stripes down his black back, who eats the silk from the young ears. These worms do not often appear in such numbers as to do great harm before they are detected and picked off. A spray of arsenate of lead will check them if they become too numerous.

**Crows and Blackbirds.** — Some gardeners have been driven almost to despair by the crows, which perch on near-by trees waiting impatiently for them to go into the house. The crow has almost supernatural skill in locating the kernels of corn where they have been dropped and sometimes cleans up a whole patch before it has sprouted.

The Yale University Department of Agriculture made careful investigation on this point and reported that if the patch were cross harrowed, after the corn was planted, the crows would be able to find very few seeds. Apparently the crow recognizes the spot which has been stirred to put in the kernels, but if all the earth has been stirred, he is at fault. The corn itself will not be moved at all by the spike, or hackney harrow, as has been amply proved.

Washing the seed corn in a weak sulpho-naphthol

solution, a teaspoonful to a gallon of water, just before planting, will also be pretty sure to spoil the crow's appetite.

White rags tied to string about the field, or to sticks, will make crows and blackbirds more wary, if they show a tendency to pull off the tender shoots of the sprouting corn.

### When to Pick Corn

It takes some practice before one can tell, by feeling, just when corn is ready to eat. For the beginner, the safest way is to examine it now and then, soon after the silk turns brown and shrivels. By pulling the envelope apart a bit, you can see for yourself just how ripe it is. Do not examine it at the top, but about two thirds up. Frequently the ear is ready when the top kernels have not developed. If it is not ready, push the husk back over the opening to keep out the air. Usually, when corn is ready to pick, the husk becomes quite thin, and the kernels may be felt distinctly with the fingers.

# CHAPTER XIII

## CUCUMBERS

It is interesting to read the notes on cucumber culture which come from different parts of the country. In some places, a few seeds stuck into the ground will grow, with little care, into prolific vines. In other places, success with this plant comes only to the most expert. In New Hampshire, for instance, cucumbers have no serious enemies and, with a little cultivation, will grow luxuriantly. In Rhode Island, only the most experienced and careful gardeners can get enough to pay for the room and labor required. In some other parts of the country also, cucumbers require more care than they did years ago.

This plant, like others in the vegetable kingdom, seems to acquire, after many years' growth in one locality, an increasing number of enemies, which make successful cultivation more and more difficult. If you have had a failure with the crop, don't be discouraged. Cucumbers may be grown in most places with proper care; they call for certain conditions which it is usually possible to supply. There

is no greater satisfaction than in taking up a task which requires skill and care and proving your power to accomplish results.

## Kinds to Choose

**White Spine.** — One cucumber, the *White Spine*, stands easily at the head of any general list. It is

Arlington White Spine Cucumbers

hardy, of strong growth, and produces handsome, large fruit, which is almost always free from the puckery taste formerly so frequent in cucumbers. All dealers have strains of this variety which have proved of special value in their respective localities. For general table use, it would be hard to find another to take its place.

**Varieties Specially Adapted for Pickling.** — For pickling, the *Boston Pickling*, the *Green Prolific*, and the *Green Cluster* are all recommended. These are early sorts which may be planted for the general pickle supply, along in the early summer, even as late as July, except in the northern belt. The *Japanese Climbing Cucumber* is a type which climbs on any support that is provided. This has fruit of the best quality and, as the vines are off the ground, it seems to be less affected by blights than other varieties.

It would be a good plan to test out a hill or two of each of three or four varieties. The seed is inexpensive; and in this way you may find one type which succeeds in your vicinity, where others do not do well.

## Planting

**Two Crops.** — Cucumbers are very sensitive to extremes of both cold and heat. The lightest frost in the spring will spoil the young plants, and the hot, dry weather of midsummer is likely to hurt the mature vines. For this reason it is best in most localities to plant an early crop, which may die out in midsummer, and a second crop, which will be maturing after the hottest days have passed.

As partial shade is good for cucumbers in July and August, it would be well to plant a few hills in the rows between the late corn. These vines will have sun enough during the middle of the day, but

are given partial shade to keep them from drying out in hot spells.

**Starting in the Window Box.** — For the earlier crop, seeds may be planted in the cold frame if desired. Pots or baskets may be used, but, as the young vine is not easy to transplant, a piece of sod is the best place for its early growth. Cut pieces of sod about four inches square, invert them in a window box or in the cold frame, and thrust into each four or five cucumber seeds an inch apart. When the weather is suitable, these sods may be placed in the hill without disturbing the roots in any way.

**Preparing the Soil in the Garden.** — When the trees are well covered with foliage and warm weather has set in, prepare the hills in the garden. If there is a part of the land which is more moist than the rest, choose this for the cucumbers and melons, avoiding, of course, ground which is not well drained. The hills should be as large as the circumference of a barrel and four feet apart each way. Scoop out the earth to a depth of about six inches, and remove the stones. If you have well-rotted dairy dressing, mix that with the earth which is to be returned to its place, two or three shovelfuls to a hill. If you have dressing that is too fresh and lumpy to mix well with the earth, put it in the bottom of the cavity. Wet it and stamp it down thoroughly. Then replace the earth till it is about level with the rest of the ground. Mix a

handful of commercial fertilizer with the earth on the top of the hill, to start the seeds.

**Sowing the Seed.** — When the earth has been replaced and firmly packed down, till the edges of the hill are on a level with the soil around it and the center is slightly higher, scatter ten or fifteen seeds

An old well bucket, sunk in the ground, provides water through the dry spells for several hills of cucumbers.

about an inch apart. Sift over these a half inch of soil, rounding it up towards the center. Make this firm with the shovel. Then sift a thin layer of earth on top for a dust mulch. This will make a hill nearly two feet across, well fertilized, with a crown rising about two inches above the surrounding level. Do not make this mound, or hill, much higher than

that, or the water will drain away too fast and leave the young plants dry.

**A Simple Method of Irrigation.** — If the summer in your locality is likely to be hot and dry, a very simple and effective means of irrigation may be provided by placing an old pail or keg in the ground in the center of the square formed by four hills. The bottom should leak freely, so that the water may be absorbed into the earth and find its way as needed to the roots of the near-by vines.

## Insects and Disease

In some localities cucumbers must be protected against both bugs and blight. In all localities bugs must be expected. Fortunately, one or two simple remedies are at hand which will make it possible to protect cucumbers from these various enemies.

**Flies and Beetles.** — As soon as the first leaves of the cucumber appear, they are usually attacked by a small, black fly, or a yellow-striped beetle, or both. In fact, where growth is slow, the beetle may become impatient and meet the new sprout halfway up.

If the plot is small, the most satisfactory way to protect against these is to bend a wire or supple branch, thrusting the ends into the earth at each side of the hill. Over this a piece of mosquito netting may be thrown, and earth gathered on the edge to hold it in place. This netting serves the plants in a double sense. It keeps the flies and beetles

away, and it also tempers the extremes of heat and cold to the sensitive sprout. It keeps it warmer at night and breaks the direct rays of the midday sun.

If the netting protectors are not convenient, the plants may be sprayed with arsenate of lead, or Pyrox. Pyrox is the most convenient form of spray, as it is easily mixed and will soon be needed as a defense against the blight. It is worth while also to plant a few radish seed in the hill with the vines. These will sprout first and will attract the main offensive of the fly army, as flies usually prefer the radish plants.

**Blight.** — Where wilt and blight are to be feared, spraying with Pyrox must begin as soon as the true leaves appear and the plant begins to run. A light spray only is needed. The small hand-sprayer mentioned among the tools may be kept loaded for use and handy. Be sure that the foliage is kept protected by a thin covering of this blight preventive.

### Culture

When the plants are well sprouted, begin to thin them out, weakest first, leaving not over four to mature in each hill. The screens may be taken off as soon as the plants begin to run, as the spray will then effectually protect the vines from insects. The soil between the rows should be kept deeply stirred with the wheel harrow or cultivating fork, and the hills should be carefully turned over with the trowel at

least once a week. This cultivation should be kept up till the vines cover the ground. Then any weeds which persist in crowding in may be pulled out as

ONE GIRL'S CUCUMBER PATCH

you gather the cucumbers. Always take the greatest care in working about the plants, as they are easily hurt and do not recover well from injuries.

The amateur will understand that the screen of netting must always be removed before the plant begins to blossom. The cucumber bears a little cluster of blossoms here and there along the vine. Some of these are male, and some are female, blossoms. The cucumbers grow only from the female flowers. These must be fertilized with pollen from the male flowers before fruit can develop; and the bees, which fly from one blossom to another, are depended on to do the work. They pick up, on their hairy legs, the pollen from the male blossom, and when they call next door on the female blossom, they leave some pollen behind them. Of course, if the screen is left on, the insects cannot approach the blossoms.

### Gathering Cucumbers

Cucumbers must be carefully watched as they mature and picked at just the right time. If they are left a day or so too long, the change is very rapid. The skin and seeds become hard, and the flesh quickly gives place to the ripening seed. Usually the fruits show a cream white at the blossom end as they approach the best stage for picking. In a day or two, this white turns to yellow, a sign that the seed is ripening. Take a short knife or a pair of scissors, each morning while the vines are cool, and cut the cucumbers that are ready. Do not pull them away or twist them off.

Cucumbers gathered in the morning and stored in a cool place will keep fresh and sweet for some days. If they are gathered in the heat of the day, they do not readily regain their crispness.

It is very easy to hurt the vine, and it will stop bearing soon if much disturbed. Any fruits that are left to ripen will seriously check the growth of others. If well tended and nourished, the vine will, in many localities, go on bearing till frost.

A Fifteen-Year-Old Boy and His One Sixteenth of an Acre Garden

# CHAPTER XIV

## LETTUCE

THERE is no excuse for any one who buys his lettuce at the store during the summer season. Lettuce may be grown with complete success in the tiniest garden. Even the flat dwellers may have it also. A window box, fastened outside the wall, will support a surprising amount of the best, if rich earth is used. Lettuce, of all plants, should be grown at home; for salad greens may become, instead of a delicious addition to the hot weather menu, an actual danger, if they have been wilted and exposed to dust. Lettuce, once wilted, is edible lettuce no longer; water can never restore it to good condition.

### VARIETIES

**Multiplicity of Kinds.** — The beginner may well be confused by the long list of names under this head in the seed catalogues. Fifty varieties and strains may easily be counted, each of which is good according to its kind; but all are not desirable from the standpoint of the beginner. Some

call for experience and special conditions, to insure even partial success.

Three types of this plant show marked differences in habit and appearance:

**Head Lettuce.** — Head lettuce, like the *Simpson*, *Tennisball*, and *Big Boston*, must be carefully handled. The young plant must be grown in rich, light seed beds, with plenty of root space. It must then be transplanted under equally good conditions, in order to secure satisfactory heads. The amateur is frequently disappointed with lettuce of this type, as it has a tendency to grow rank and stringy, if anything interferes with perfect growth. It has a plain leaf, which is not desirable for food until the heads are formed.

Big Boston Lettuce

**Loose-Leaf Lettuce.** — Loose-leaf lettuce, so called, is pretty sure to yield enough edible leaves to repay the efforts of the youngest beginner. The seed may be sown in drills, and the leaves eaten as soon as they are big enough; or it may be started in the seed bed and transplanted. The leaves of most plants of this variety are of good quality as

soon as they are large enough to pull. The *Grand Rapids* and *Hanson* lettuce are good examples of this type. The *Grand Rapids* has a deeply crimped leaf which is good while young, growing rank and coarse without forming a head, as it matures. The *Hanson*, which will probably be found nearer to the ideal for the home garden than any other, has a leaf somewhat crimped, with notched edges. It grows quickly into crisp leaves, which are edible at once. It will then develop large, solid heads of the finest quality if given plenty of room and proper care. Lettuce of this habit, edible from its first month on, greatly prolongs the table supply from a single planting, and gives the inexperienced gardener a sure reward for his trouble.

HANSON LETTUCE, JULY FOURTH

**Romaine.** — Besides these two common varieties, there is a lettuce of a still different type, the *Romaine*, or *Cos* lettuce. This is not seen much as yet in this country, but it is found always in the markets

of southern Europe during the summer months. The special advantage of this type is that it forms crisp, firm heads in the hot season, when other lettuce quickly goes to seed. It is, however, not so easy to handle as the loose-leaf lettuce, and should be tried by the amateur as an experiment. The *Cos* lettuce grows in tall, compact heads, and is rather firmer and heavier in texture than the other types.

**Colored Lettuce.** — Most of the common varieties of lettuce are light green in color, but all seed houses carry crimped types which have edges colored in bronze, or golden brown. These are usually of good quality and vary little from the general type which these special strains represent.

## Planting

**Sowing Seed in the Window Box.** — To get good plants in the cold frame, or in the window box, at home or at school, prepare two or three inches of soil, made light and rich with well-rotted manure. Lettuce seed is very small, but it is pretty sure to sprout and thrive. It should, therefore, not be put in too thick. When the earth is fine, firm, and level, sprinkle the seeds here and there over the surface, leaving a half inch between each seed. Then sift over this just enough rich soil to cover it well; a quarter of an inch is enough. As this may easily be kept watered, there is no need to press it down.

If you plan to eat this lettuce as soon as it is large enough, it may be planted rather closer than half an inch and the leaves pulled here and there as they grow. Such plants, however, which have been crowded when young, will develop little root growth, and will not be suitable to set out in the row for heads. When plants for setting out are desired, they must have plenty of room, at least two inches each way, as soon as they begin to grow.

**Transplanting.** — In setting out, allow about six inches in the row and have the rows from one foot to two feet apart. For general garden work, a foot is rather narrow space to work in. Mark off the rows and dig holes three inches deep with the trowel, removing all stones. Be sure that the earth all about the holes is thoroughly moist. Fill them with water and let it soak in a few minutes. Then take up as much earth as you can with the lettuce roots, and set the roots in the hole so they will be spread out. Gather the earth firmly about the roots, press down with the fingers, and scatter a little dry earth loosely over the spot, to keep the surface soft and hold the moisture in.

Before leaving the plant, nip off the larger outside leaves. Remember that the root is not able at first to draw much nourishment from the new soil about it. If it tries to support all the leaves it was supporting before, these leaves must suffer from the change. If only part of the leaves are left for the

roots to feed while they are getting hold, they can probably do it fairly well. The plant, as a whole, will not be greatly retarded.

In pulling the heads, take the largest first, here and there in the row, leaving room for the others to develop to their full size.

**Sowing in the Garden.** — A most satisfactory way for the amateur to provide the family with lettuce from the home or school garden, is to sow it in drills as soon as the soil can be worked fine and loose. For this purpose, *Hanson* lettuce surely has no superior. Lettuce is hardy, and the seed can be planted soon after the frost is out of the ground. Do not take too much space. Twenty-five feet in drills will provide amply for a family of five. Make the soil soft and rich, with well-rotted dressing of some kind. It is hardly possible to get the soil too rich with stable or dairy dressing. Lettuce is largely water, and without a constant supply at the root, it cannot make fair growth. The dressing sucks up water like a sponge, and holds it where the roots can readily get it. If commercial fertilizer must be used, mix five or six pounds thoroughly with the soil in the twenty-five-foot row, and use a pound along the row every two weeks or so, after the plants are started.

When the soil is worked fine and raked level, make a crease along the row, not over half an inch deep, by pressing a strip of scantling or the rake

handle, into the earth. Into this, scatter the seed, thirty or forty to the foot. Sift over the seed just enough fine soil to cover it completely, and make it firm with the rake or shovel. Then add a light sprinkling for the dust mulch.

**Thinning Out.** — When the young plants are about three inches high, they are ready to use. Take a strong table knife, and drive it under the roots in the row where the plants stand thickest. Lift out the little plants, roots and all, shaking the earth from the roots back into the row. This leaves an open space of freshly turned up earth, about an inch wide, for the other plants to spread in. By doing this here and there, where the plants are thickest, they are kept from crowding as they grow, and at the same time the earth is kept soft. If you try to pull out these extra plants with the fingers, you will leave more than half the roots in the ground, to choke the growth of the other plants. Gradually widen the spaces between the plants until they stand five or six inches apart. Then these last plants, if a heading variety like *Hanson* has been used, will form good heads to complete the crop.

**Lettuce for Succession.** — To keep the supply of lettuce constant, additional plantings should be made. It will be found, however, that about three lots will satisfy the family, unless the fondness for this plant is unusual. No ordinary care will produce good lettuce during the hot days of midsummer.

Shade must be provided then, to keep the plants edible. A good plan is to plant an early crop; then a small row three weeks later. In most places this will keep up the supply into July. During midsummer there will be so many other good things from the garden that lettuce will not be missed. A sowing late in July will give a fresh crop for fall.

**Shade for Lettuce in Hot Weather.** — If lettuce is wanted during hot weather, it should be planted in a shady spot, or shaded with a lattice. The *Cos* lettuce may be used for the hot-weather crop. This grows in a tall, erect head. The outside leaves should be gathered and tied together with a soft string, or strip of rag, in order to blanch the leaves and make them crisp.

## Enemies

Lettuce is one of the few garden vegetables which is troubled by no disease, and by no worms or insects, when once well started. The cutworm is, indeed, fond of it; but he can do little harm to the lettuce bed if some of the cutworm bait, arsenate of lead and bran with sweetened water, is dropped in spoonfuls between the rows.

# CHAPTER XV

## ONIONS

BEFORE a gardener decides to grow onions, he should look over his land. Onions positively must have rich, fine, soft earth, free from stones. Onions also require sufficient care to keep them free from weeds at all times and to insure soft, open soil. If you can supply this much, you can grow onions as well as any one. There is no trick to it, but constant attention is necessary to get a good crop.

RED GLOBE ONION

### VARIETIES

The onions most suitable for general home gardens are the globe varieties, like the *Danvers* and the *Red Wethersfield.* These are hardy and develop solid bulbs, which keep well and have a

desirable flavor. The *Prizetaker*, a very large yellow onion, often sold in the stores as the *Spanish* onion, may also be grown; but it is not wise to try to grow it from seed, except in the southern states. In the South, the flat white onion is a great favorite. It is very early, having the mild, sweet flavor which has given the *Bermuda* onion its great popularity.

## Three Methods of Growing

Onions are planted in three ways: from seed, from sprouts, and from sets. The sprouts are the young, green plants, six weeks or two months old, which are transplanted to the garden like cabbages. The sets are tiny onions, grown the fall previous, and planted like tulip bulbs, instead of seeds. All three of these methods are used successfully by gardeners in all parts of the country.

## Growing Onions from Seed

**Preparing the Soil.** — In growing onions from seed, pick out a smooth, fertile spot and work over the ground thoroughly. Unless you have dressing which can easily be broken up and mixed with the soil, it is better to use commercial fertilizer. Ten or fifteen pounds to the twenty-foot square should be worked into the soil a day or so before planting. It is safer to turn the ground over twice, several days before planting, if possible. This will help greatly

in the control of weeds, which is frequently a serious problem in growing onions.

**Importance of Good Seed.** — Many failures in onion culture are due to poor seed, or to seed not suited to the location. Try not only to get seed from reliable people, but seed that others near

FIELD OF DANVERS GLOBE ONION GOING TO SEED

you have proved good. If in the South, get seed from southern people who understand onion growing; follow the same plan in other parts of the country.

**Time of Planting.** — Onions take little damage from cold. They should be planted as early as possible; a frost will do them no harm. In the southern states, they may be planted in the fall;

then they ripen rapidly when the growing season arrives again.

**Sowing the Seed.** — When the ground is ready, rake the surface smooth and fine, measure off the rows with the line, twelve or fifteen inches apart. Sink creases with the scantling or rake handle, as the onion seed needs a solid bed beneath it, in case the weather is hot and dry. Into the crease, about an inch deep or a trifle less, sow the seed thinly. Onions are fairly easy to transplant, and it is a good deal easier to set them in, here and there, to fill up a gap than to pull out a large number of plants. Three seeds to the inch is enough. Sift half an inch of soil over the seed and make it firm, finishing with a light dust mulch.

THINNING THE ONION BED

**Thinning Out.** — As soon as the sprouts are three or four inches tall, thin them out, leaving the plants about two inches apart. Use a small trowel for this work. Loosen the earth carefully on both sides of the row, turn it over to expose weed roots to the sun, and then pull out extra plants with the fingers.

**Cultivation.** — No further care need be taken, except to keep the earth soft and loose about them throughout the season. This means a good deal of hand work, as the weeds quickly choke onions if they get in among them.

### Sprouts and Sets

**Growing Sprouts in the Window Box.** — Onion sprouts may be grown in a window box, or, in many places, can be purchased from seed houses. To grow the sprouts, the best plan is to make with matches little holes, an inch apart each way, in the window box soil and drop one or two seeds in each, a half an inch deep. The soil, of course, should be light and rich. If the seed is crowded in the box, the roots will be tangled and weak, hardly fit to set out.

**Setting Out.** — When the sprouts are four inches high, the onion bed should be prepared as for seed. The sprouts should be set three inches apart except for the larger varieties, which may be four inches apart. The rows are easier to work in if there are fourteen or fifteen inches between them. In setting the sprouts, be sure the earth is soft and moist and the hole large enough so the roots will not be cramped. Gather the moist earth firmly around them with the fingers.

**How to Plant Sets.** — By far the easiest and most satisfactory way for the beginner to raise a few onions for home use is to plant a quart or two of

sets. These are tiny onions, already partly grown. They may be put in as soon as the bed is ready in the spring, and require no care after planting, except cultivation. They are buried two inches deep, three or four inches apart in the row, and soon sprout, growing to a large size and maturing six or seven weeks before seed-planted onions would ripen.

White Onion Sets

**Enemies.** — Reports from various parts of the country show that the onion is still free from enemies which greatly endanger the crop. The thrip, a little insect that punctures the leaves and sucks the sap, can be controlled by kerosene emulsion. The cutworm, which will attack young onions, can be poisoned with cutworm bait — the arsenate of lead and bran mixture.

The root maggot sometimes does a good deal of harm, especially if the crop is growing slowly. To keep the maggots from spreading, pull out and burn plants which are dying. At the same time, sprinkle a little nitrate of soda or fertilizer about the rows to stimulate growth.

### Harvesting Onions

**Drying.** — As the onions ripen, the tops begin to turn yellow and dwindle. When this happens, pull the bulbs and lay them along the row. Do this in dry weather. They should be thoroughly dry before they are packed up, and this will take five or six days, at least. If the sun is hot, gather them in little heaps after the first day, so that they will not be too much exposed. Onions, as well as potatoes, sunburn if left exposed too long in one position.

Danvers Globe Onions Fifty Days after Setting out Sprouts

**Storing.** — When they are well dried, clip off about half the top. Do not remove the roots, nor the rough outer skin. They must be stored

where it will be dry, airy, and not too light. A dry, well-aired cellar is the best place, as they can be kept cool there, without danger of frost. Place them in crates or in small piles, where they may have free ventilation at all times.

VEGETABLES GROWN BY A SCHOOLBOY ON ONE EIGHTH OF AN ACRE

# CHAPTER XVI

## PEAS

The first thing to plant in the open ground, when spring arrives, is the pea. The pea has wonderful endurance and vigor. Even a sharp frost can do it little harm.

Some people plant peas in the late fall to get an early crop. This works well almost everywhere in the temperate zone, with the sweet pea, grown for its flower; but the garden pea does not flourish so well after a winter in the ground. There is a good deal of testimony to show that it does not pay to plant peas, hardy as they are, before spring has fairly come and the winter frost is out of the ground.

### Kinds to Choose

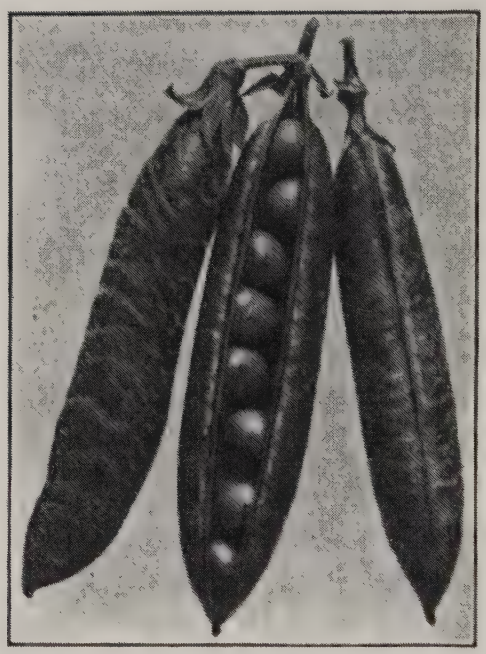
Plant at least two varieties of the pea as a staple crop, frequently trying a third sort, to be sure nothing good escapes you. The majority of experienced gardeners give little space to the smooth varieties, planting only wrinkled peas. There are smooth peas that come a few days before the wrinkled peas, but they are of poor quality compared with the

others. Peas take up a good deal of room in the garden and need much fertilizer to make them do well, so it seems unwise to give up much space to a variety that has small value.

**Extra Early.** — The extra early peas are quick to mature and develop the pod promptly, as the vines are short and so demand little strength from the root for their development. The *Nott's Excelsior* represents this variety well, which also includes excellent peas in the *Little Marvel* and the *Little Gem.* Both the *Nott's Excelsior* and the *Little Gem* have many strains, which are given various names in different places. The *Little Marvel* is a recent addition which is much praised, but not widely used as yet.

For the first early peas, there are few that do so well in different localities, under varying conditions, as the *Nott's Excelsior.* It is of sturdy growth, with short, stocky vines which need no support. It produces a generous crop of rather small, well-filled pods. The flavor and quality are excellent, and the pods are so well filled that two quarts will provide peas for a family of five.

**Second Early.** — After the extra early peas, there is a group which ripens a few days later. This variety, of which the *Gradus*, the *McLean's Advancer*, and *Thomas Laxton*, are good representatives, has vines growing nearly three feet high, which need supports to ripen the crop to the best advantage.



GRADUS PEA

They have large, well-filled pods, and peas of superior size and flavor. Because of their quick growth and large crops, these peas are found in the gardens of experienced farmers everywhere.

**Main Crops.** — For the main crop of later-season peas, we have those like the *Champion of England*, *Marrowfat*, and *Telephone*. These may be had in the dwarf strains, but the standard climbing varieties are usually planted. They develop large, bushy vines, sometimes six or seven feet high.

The *Telephone* represents this group well. It is hardy, of strong growth, and is without a superior as a table delicacy when cooked twelve to fifteen minutes and served with a little butter. This pea grows to a height of five or six feet and bears great, heavy pods, often containing seven or eight peas. If well fertilized, and grown where the soil is not too dry, this type of pea will continue to bear for nearly a month, as it sends out a remarkably strong root growth.

## Planting Peas

**Soil Best Adapted to Peas.** — Peas grow well in heavy, moist soil that is not suitable for some other vegetables. However, the land for peas, as for all vegetable plants, should be drained and free from standing water. Nothing is quite so good as dairy dressing for peas, and it is worth while to get it if possible.

**Fertilizing.** — When dairy dressing is at hand, be sure the ground is soft and fine; then open furrows about eight inches deep. These should be three feet apart for the *Nott's Excelsior* type, and four feet for the climbing types. Into these furrows throw a liberal layer of dairy dressing, to cover the bottom of the furrow. If you can spare it, put in a wheelbarrow load to twenty feet, since peas are great feeders and need nourishment during the hot days of July when the crop is ripening.

Here is one case where dairy dressing may be used that is rather fresh, as peas seem to do well with dairy dressing at any stage. Stable dressing, which contains straw and horse manure, is more likely to develop heat, which will hurt the seed; so fresh stable dressing should not be used in the rows.

**Sowing.** — Over the dairy dressing, draw an inch or two of earth. This should be trodden firmly into the trench, leaving it about five inches deep. The

peas are then sown, fairly thick, about a quart to one hundred feet of row. The earth is again drawn back over the peas to a depth of about two inches, and made firm above them.

In case dairy dressing cannot be secured, make the ground rich with poultry droppings or commercial fertilizer. Do not place either of these in the row with the peas, for they are likely to burn the tender plants as they find their way to the surface. Scatter about two wheelbarrow loads of poultry droppings, or ten pounds of commercial fertilizer, to each hundred feet of row, working them thoroughly into the earth before opening the furrow.

Whatever fertilizer you may use, it is a good plan after planting to sprinkle a little commercial fertilizer, or nitrate of soda, over the row above the peas. Sprinkle it on about as thick as you would put salt on mashed potato. This gets quickly to the first small roots and helps the sprout along until the roots are tapping the main source of supply.

Cover peas gradually as they grow. In using dairy dressing, the furrow is opened deep enough to admit putting the manure well below the peas. Of course this deep furrow is not necessary when fertilizers are worked into the soil. In that case, the furrow is opened to a depth of only about four or five inches. In either case, two inches of earth is drawn over the peas when first planted, and this leaves another inch or two of earth to draw about

them after they have grown five or six inches high. By this method the roots are well covered with the moist earth, and when the hot days come, they keep cool and free from the effects of the hot sun, which is quick to dry the vines if the roots are not well covered and protected.

**Thinning Out.** — When the peas are up an inch or so, it is time to thin them out. Crowding is responsible for many poor crops of peas. Thin out the dwarf peas so that they stand about an inch apart, and the tall ones so that they stand about an inch and a half apart. Pull out the weaker sprouts first. It may take some courage to thin them out, but it pays in the end.

**Protection from Birds.** — Blackbirds are fond of pea vines when they are young and tender. Sometimes they will nip off the sprouts and spoil a long row in one early breakfast. A white string, stretched above the row, with white rags tied here and there, will usually keep them away. Small flags, made by tying a strip of white cotton cloth to a stick, stuck along every fifteen or twenty feet, will serve well also. If there are many blackbirds about, it is a wise gardener who takes this easy precaution. It is a little too late after the birds have been there.

### Caring for the Vines

The dwarf peas need no further care, except cultivation to keep the earth soft and free from weeds.

The blossoms form in about four weeks, and the peas ripen quickly after that. The season for peas begins, in the southern states, early in May, and they are picked in August along the northern belt. Because of its fondness for cool climates and moist earth, the pea is most delicious and profitable in those states where the summer days are not extremely hot.

**Supports for Climbing Peas.** — For the tall peas, a support must be provided on which the vines may

NOTT'S EXCELSIOR PEAS IN FRONT, TELEPHONE PEAS ON BRUSH

Some vines were eight feet tall. The white lines show the string put up to keep crows away.

climb. The great mistake usually made at this point is in having this support too low and too weak. Remember that under favorable conditions the tall

peas will grow into large, bushy vines, sometimes six feet high.

There are three satisfactory ways of providing supports for the vines of tall peas:

**Twine Supports.** — Stakes about seven feet long may be driven every five or six feet along the row, and strong twine strung between them. This has the advantages of being inexpensive and easy to get in any locality. Some farmers in Maine, who make a specialty of *Telephone* peas, use this method on large patches. Take in the twine at once, when the crop is gathered, and put it away for the next season. If cared for in this way, it will last many years.

**Chicken Wire.** — Chicken wire may also be used successfully. In using this, the stakes may be placed ten feet apart, as the wire will sag very little between the stakes. Be sure to have the bottom of the wire fastened so that it cannot sway with the wind. A man who had a splendid garden planted some climbing peas along chicken wire. They grew well and promised much. Then they began to die. He could find no trace of bugs or worms and was much mystified. One day he found that the wind had blown the wires back and forth till they had nearly pulled the roots out of the ground.

**Brush.** — Where it can be obtained, the brush support will prove the best method in growing tall peas. The brush shoots out its branches in all di-

rections and keeps the vines apart, exposing each leaf to the sun and air, at the same time shading the roots a little as the vines grow. The leaves need sun. The roots need protection from its hottest rays.

Take strong bushes, preferably wild cherry or gray birch, seven or eight feet high. Trim the bottoms for at least a foot. Then make holes with a bar along the lee side of the row about two inches from the seed, and thrust the brush down a foot or more firmly into the holes till the first branches touch the ground. If the earth is gathered about these bushes firmly, they will stand the weight of the vines when they are grown, even in a high wind.

The bushes are placed on the lee side, that is, the side towards which the prevailing wind blows. When the trellis is placed thus, the wind will blow the vines toward the brush instead of away from it, as they grow. If there is little summer wind in your locality, or no prevailing wind, then put the brush on the side toward the sun, as the sun draws all growing things to itself.

The distance the bushes are placed from each other depends upon their size and the way their branches are arranged. The larger ones might be two or three feet apart, and smaller ones stuck in between. Something must be provided for each pea vine to cling to and climb on.

## Picking Peas

It does not pay to pick peas before they are fairly well filled out, as they are wasted in that way. You can soon learn to tell, by a gentle pressure of the thumb near the lower end of the pod, whether the peas are large enough to pick. On the other hand, it is unwise to leave them on the vines to dry, as that will tend to check the growth of the peas forming at the top of the vine.

Pick Peas Without Pulling on the Vines and Save Those Coming Later

In taking the pod from the vines, be careful to use both hands. Hold the vine with one hand just above the pea, to save the tender branches from being torn. Remember the new peas which are coming above those you are picking, and give them a free chance to mature.

## Follow Crops

As soon as the crop of peas is harvested, pull out the vines, put away the supports you wish to save

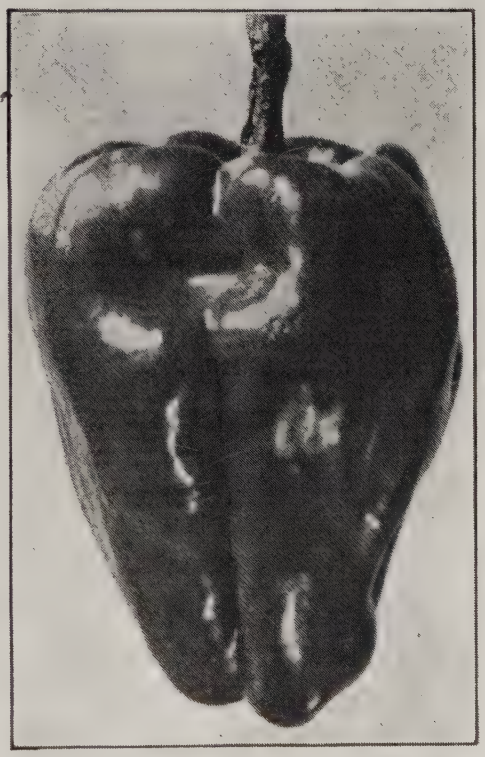
for the next season, and dig over the ground for a crop of something else. Bush string beans, turnips, cabbage, winter beets, lettuce, and other quick growing plants may be put in the same rows. If the peas have been well enriched, two or three pounds of commercial fertilizer for each hundred feet of row will be sufficient for the second crop.

THIS BOY GREW THESE VEGETABLES ON ONE TWENTIETH OF AN ACRE

# CHAPTER XVII

## PEPPERS

AMERICANS who travel in European countries always speak of the appetizing flavor that those people can give to simple dishes. This is due to the use of aromatic herbs and plants, which are little used as yet in America. Among these, the sweet pepper plays an important part. The Italians are especially fond of peppers and have bred varieties of unusual size and quality. We should, ourselves, learn the use of the sweet pepper, which grows easily in almost any garden. It may be eaten raw in salad, or stuffed and baked.



LARGE BELL OR BULL NOSE PEPPER

## Varieties

There are several types of pepper which may be grown successfully in any good garden land. The *Large Bell*, or *Bull Nose* pepper, is seen very often in the market. The fruit is large, and the flesh is thick, being rather less pungent than most varieties. The *Squash* pepper, which is much used for pickling, is very hardy and matures quickly. It is shaped much like a tomato, growing on short, dwarfed plants. The *Italian* and *Chinese Giant* are both much grown in warm states. They are very large and have the mild flavor required in sweet peppers.

Squash Pepper

## Growing from Seed

Pepper plants, as well as seed, are for sale in most large towns. The plants, though slow in starting, are very hardy and easy to grow in the window box. A very small box allows room enough. Put into a small, shallow box three inches of rich, light soil and make it level and firm. Then punch holes

with a match, a half inch deep, an inch apart each way. Into each hole put two pepper seeds and cover over. Keep the soil moist.

The seed will not sprout for nearly two weeks, so do not think it is dead if it is not up with other seeds. When it comes up, save the best sprout in each spot and let them grow till over an inch high. Then set in another box, two inches apart. When the weather is warm, set them out two feet apart each way. Peppers are much stronger and produce more when they are transplanted in this way. They may, however, be planted in the garden during May and thinned out in the row.

No disease or pest is likely to attack peppers, and when once started, they usually develop a good crop, no matter what the season may be.

A Schoolboy's Half Acre

# CHAPTER XVIII

## POTATOES

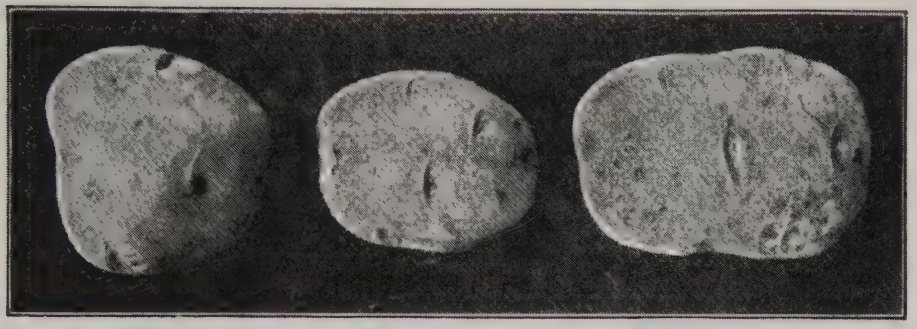
POTATOES are not difficult to grow, but skill in choosing the seed and handling the crop makes a big difference in the results. For a long time people grew potatoes and were usually satisfied to get a fair crop. They did not bother to compare methods and results with others. They had new ground to plant, and were, therefore, quite free from the Colorado beetle (potato bug) and the blights, which make potato growing more of a problem to-day.

Of late years, however, the papers sent out by experts have aroused the attention of thoughtful farmers, and they are studying the methods and results of those who produce large crops, in order to improve and increase their own production.

### EARLY POTATOES

**Varieties.** — There are several varieties of the potato, well represented by the *Rose*, the *Cobbler*, and the *Delaware*, which are known as early potatoes. They are hardy, quick-growing sorts, which withstand cold well and may be planted soon after the

frost is out of the ground, ripening a good crop several weeks before the main winter crop is ready.



IRISH COBBLER EARLY OHIO GREEN MOUNTAIN

**Planting.** — In planning for the early potatoes, choose the best and warmest part of the plot reserved for this vegetable, and use a little more fertilizer than is given the regular crop, to insure a quick start and steady growth.

**Raising Extra Early Potatoes.** — Potatoes are usually costly until early fall. It is, therefore, worth while to get some started extra early, so that they will be ready for digging in August, a fortnight before the regular early crop is ready. To do this, start fifty or sixty pieces of seed, about enough for a fifty-foot row, in the house. Start them about two weeks before it is safe to put potatoes in the ground.

Take a box about one foot wide by two feet long, which fits well into a sunny window. Line it with newspaper, to keep dirt from sifting through the cracks. The box should not be water-tight. Put

one inch of sandy soil in the bottom. Then place in the box the seed of *Early Rose*, or any other early potato, with eye up, side by side in rows, and cover with another inch of sandy soil. Keep the earth moist. This is an interesting experiment to try in school.

POTATO SEED READY TO COVER WITH SAND, AND SPROUT IN THE WINDOW

Enough here for a forty-foot row.

Keep this box in a sunny window. By the time the ground in the garden is warm, strong sprouts will be shooting up through the thin covering over the seed. Pick out the warmest and most fertile spot in what is to be the potato patch, work the ground over well, fertilize it properly, and open a furrow about four inches deep, long enough to plant the pieces about ten inches apart.

Lift the seed from the box carefully with the small mason's trowel, and press firmly into the row with the sprout up. Draw enough earth over the sprouted seed to cover the pieces about two inches deep, but do not press the earth much above them, or you may break the sprouts. When the plants are about six inches high, draw the rest of the earth about them.

With careful attention, these should grow very rapidly and should supply the table with potatoes long before the regular crop is ready.

### Later Potatoes

**Advantages of Raising Late Varieties.** — It is generally wiser to depend for the main crop upon the later standard varieties, which are well represented by the *Green Mountain*, *Gold Coin*, and *Carmen*. There are several reasons for this:

In the first place, there is no hurry about getting the seed into the ground, so planting can be left till all danger of frost is over. This is important, as the potato is sensitive to cold.

The standard potatoes, planted after warm weather has come, are in less danger of attacks from the Colorado beetle, or potato bug, which now inhabits nearly every part of the land. Having a strong and rapid growth, they overcome accidents and natural obstacles with greater success. It is a well-founded opinion that the later potatoes are more free from blight than those planted before them. This is probably due to the fact that the plant is exposed a shorter time, and the microscopic spores which cause the blight get less chance to find a lodging in its foliage. It is generally true that the stronger and more rapid the growth of the plant, the more certainty there will be of a generous harvest.

## Potato Seed

**How to Choose Seed.** — For the home garden the *Early Rose* and the *Delaware* make an excellent combination, but there are other good potatoes which may do well in your locality. Find out who has a reputation for big crops of potatoes near you. Ask him what he plants, and where he gets his seed. His advice may be well worth following.

Experiments carefully completed in the East show that potatoes grown from seed bought in northern localities yield almost double the crop produced by seed grown a few hundred miles farther south. Yet many farmers still strive to save money by using their own seed, and wonder why their crops are not better.

Potato Scab

**Formalin Treatment for Potatoes.** — Scale is found in many parts of the country. It forms on the skin of the tubers, making them rough and ugly. It also reduces the vitality of the plant. By washing the seed in a solution of formalin one can protect them from this disease. Powdered sulphur is also used, but the formalin treatment is simple and more sure.

Any clean receptacle which will hold water enough

to soak a peck of potatoes at a time will serve. An empty butter firkin will be large enough. Into this put seven gallons of water and four ounces (one half cup) of formalin. Put the potatoes, whole, into a clean bag, and soak them two hours in the solution. Spread the potatoes out to dry, and do not let them touch bags or boxes where potatoes have been stored.

**Cutting Potato Seed.** — Select for seed medium-sized potatoes which are well shaped, true to the type of the potato you are planting. A round potato, though even and pretty, would not be true to the *Early Rose* type. Even if the price is high, seed potatoes cost so little more than table potatoes that it is worth the small extra expense to plant only perfect ones, using the others for the table. Like breeds like. If you plant a seed from a poorly shaped potato, that is just what you are likely to dig from the hill.

If you examine a potato, you will find that on one end, where the little stem was, there are no eyes. At the other end there are several eyes, close together. On the sides there are usually four or five more. Plan to cut the potato so that each piece will have one or two good eyes and a solid piece of flesh. The best way is to stand the potato on a board, with the eye end up. Cut down between the best two eyes in the end, taking care to divide the eyes on the sides as evenly as possible. One

can usually get from four to six seed pieces from a medium potato. Do not divide a piece having two eyes, unless you can have with each eye a good piece of flesh, cut to the center. The chances of getting a good crop are much less if only a small, thin piece is left with the eye.

### Planting Potatoes

**Choice of Fertilizer.** — Commercial fertilizer, prepared especially for potatoes, makes the best fertilizer for potato ground in general. It is easy to procure in most places and can be depended on. Dairy or stable dressing, unless it is old and well rotted, is not satisfactory. It tends to produce conditions in the soil favorable to the development of scab, which makes the skin rough and ugly.

Last year, a truck farmer on Long Island took the author over his immense potato fields and showed him the results of different fertilizers he was using. He was not only searching for the best fertilizer in general, but for the best fertilizer for each particular piece of ground.

The best for his light, rather sandy soil was guano, a pulverized manure from South America and islands in the Pacific. This guano is supposed to be chiefly the manure from sea birds, that gather in thousands on the rocky coasts; but it is difficult to say just what it is composed of now, as the bird deposits have been pretty well exhausted. The commercial

fertilizer which he used gave excellent results also. Poultry droppings are almost as good as guano.

**Preparing the Soil.** — Scatter a wheelbarrow load of poultry droppings over about five hundred square feet, and work it into the soil before planting the

FURROW THROWN ON POTATO ROW BY HAND PLOW

The seed is planted in a furrow four inches deep. It is covered two inches deep at planting. Three inches more is readily thrown against the vines, when they are well started, by the hand plow.

seed. Later, after the sprouts are up, scatter as much more along between the rows, and work it into the soil as the plants develop. This will eventually be drawn up about the plants, and they will get the full benefit of it without the danger to the tender sprouts which would be incurred if the droppings were placed too near them at first.

The safest plan, in using the commercial fertilizer, is to open the row an inch deeper than you intend to plant the seed. Then scatter the fertilizer along in the row, with a swinging motion of the arm, covering about four feet with each handful. Run the garden wheel harrow through this, to mix the fertilizer with the soil before planting. After the row of seed has been covered, scatter about a pound of fertilizer along each hundred feet of the row. This soon washes down and helps the seed in getting a good start.

**Planting Seed.** — After having prepared furrows four inches deep, lay the seed in, with the eye up. Remember that the sprout is anxious to get into the sunlight, and that the roots will not grow until it does. When the eye is up, the sprout can get out the shortest way, and the crop is earlier and better for it.

Do not draw all the earth back into the furrows at first. A covering of about two inches is enough to start with. After the sprouts are about six inches high, draw back the rest of the earth about the sprouts.

**Caring for the Plants.** — As soon as the potato begins to sprout, the potato beetles gather to the feast. It is very easy to satisfy their appetites with a little arsenate of lead, or bug death. Arsenate of lead may be applied dry or wet, mixed according to the directions in the chapter on poisons. For small

patches, it is very handy to use the lead in powder form, or the bug death.

A convenient way is to take a tin, like a cocoa or baking powder tin, which holds about a pound, and punch holes in the bottom, making a big salt shaker out of it. It takes only a few moments to cover a long row of potatoes with this, shaking a little of the powder over each plant.

**Lice on Potatoes.** — Frequently lice appear in the hot days of midsummer and threaten the potato crop. Fortunately these little creatures seldom do great harm after all, and it often happens that just as they seem most dangerous, they disappear almost in a day.

A lady came in great anxiety to a gardener.

"Oh, dear! First the lice attacked my potatoes, and now little spotted red bugs are on the vines. What shall I do?"

"Just give those little red bugs my address, madam," he said. "They are lady bugs, after the lice, not the potatoes. They will be welcome here."

**Protection from Blight.** — Beside the bugs, there is the early and late blight to look out for in growing potatoes. This blight comes from a tiny spore, which lodges in the foliage and, under favorable conditions, increases with great rapidity, floating from plant to plant, and often destroying a large patch in a short time. The whole plant becomes

diseased, and the tubers soon rot under the ground.

The safest way to insure plants against this blight is to mix a blight preventive with the poison you are using for bugs. Bordeaux mixture is a standard protection. Pyrox and other specifics of like nature provide a combination of poison and blight preventive, which enables the gardener to apply both with one dose.

Results of Potato Blight

For the gardener with a comparatively small patch, it would be easier and just as effective to use some standard combination like Pyrox, since it comes in a convenient package, is easy to handle, and is not very expensive.

There is no safe way to offer a time schedule for spraying or powdering for bugs or blight. The first dose should be given soon after the sprouts appear. After two weeks, enough new foliage will have come to demand another application. However, if it rains soon after the first application and the mixture is washed off, one should not wait

two weeks, especially if the weather is hot and muggy.

A good plan is to mix a little arsenate of lead into whatever preparation is used. It always does good and the white powder shows clearly on the leaf.

GOOD-BY TO THE HUMUS

The furrows of this potato patch run up and down hill. The vines are well hilled up. With every heavy rain each furrow becomes a little river, taking the water and the humus from the soil. Furrows should run across the slope.

When this is gone, it is a sign that the plants need more attention.

Keep up the spraying or powdering till about the last of August. The potatoes are then well set, and there is little danger of loss from insects or blight.

Do not neglect to keep the bugs off the plants during the summer, whatever you do. Through its leaves the potato plant gets a large amount of

nourishment from the air, in the form of nitrogen. If the leaves are damaged, the plant suffers; if they are hurt very much, the plant dies. The tomato, which looks so much like the potato, does not care a bit how many leaves are taken off. It will cheerfully send out new ones and keep on growing fruit. The potato foliage, however, must be carefully guarded until the season is over.

HUMUS STAYS IN THE SOIL

These potatoes are planted across the slope, and hilled only an inch or two. The level cultivation keeps the soil soft and porous, holding all moisture.

**Cultivation.** — It has been the custom to gather a hill of earth about the plants, as the potatoes grow. If the season is wet, this is a good plan, especially if the soil is damp where the potatoes are planted. But where the soil is well drained and mellow, it is more convenient to keep the rows flat, so that the wheel harrow can be run through them easily. In August, it is well to draw a little earth about the plants, and let them ripen. Deep hoeing and cultivating should be completed before blossoms appear on the vines, for these give

notice that potatoes are setting on the roots, which may be easily broken off by too close cultivation. After that the weeds may be kept down by light cultivation.

## Storing Potatoes

Unless the ground where the potatoes grow is wet and heavy, they may best be left where they are till freezing weather approaches. Then take the fork, or potato digger, and carefully remove them from the row. Set aside for immediate use those which are wounded or bruised. Do not mix them with the perfect ones.

Dig potatoes on a fair day and leave them beside the row till they are dry. At the same time, in places where the sun may be hot, see that they are not exposed too long to its rays, as they turn brown and are hurt by sunburn.

When they are ready, put them down cellar. They keep well in bags, in bins or boxes, and in piles on the floor, if the floor is dry. Do not have them piled very deep, as they need air circulating through them. They keep well all winter without further attention.

# CHAPTER XIX

## RADISHES

A LUMBERMAN once discharged a cook, complaining that he was so useless he couldn't boil water without burning it. Radishes are so easy to grow that even this man might have succeeded. They sprout almost overnight, in hot weather, and form an appetizing addition to the slim menu of the spring season. There are many varieties, most of those offered by reliable houses being well worth planting.

SCARLET GLOBE RADISH

### THREE GENERAL GROUPS

Radishes are divided into three general groups: spring radishes, small types that grow quickly and soon pass their best condition; summer radishes, of slower growth

and much larger size; and winter radishes, grown in the summer and early fall, to be kept through the winter months. The latter are large types, little grown in this country as yet, but much found in the gardens of southern Europe and Asia.

### Spring Radishes

**Planting in Cold Frame.** — The spring radish is usually sown first in the cold frame. It may be planted in rows, or scattered broadcast. For the cold frame, it does well if scattered broadcast on a piece of well enriched soil about two feet square. The seeds should be no nearer one another than about a half inch. Over the seeds sift a half inch of light soil. This must be kept moist by watering, so there is no need to pack it down about the seeds. Radishes sprout so quickly that weeds will give little trouble. When the bulbs are large enough to use, keep pulling them out to give the others more room.

**Satisfactory Varieties.** — Both round, turnip-shaped radishes and long varieties may be grown in this way. However, the long radishes seem to be giving place more and more each year to the round type, which is more perfect in growth and less likely to be peppery. The *French Breakfast* radish, of bright scarlet, with a white tip and of olive shape, and the *Crimson Giant*, a large, round, red radish, are both widely used and deserve their popularity.

**Later Planting.** — When the weather is warm, a row of radishes may be put in when planting the carrots and beets. A twenty-foot row will provide plenty, unless you wish to leave the plants two or three inches apart. If this space is given, they will be a bit earlier and more perfect perhaps. Professional market gardeners sow them rather thickly, six or eight seed to the inch, and thin out as they get large enough to pull. This crowds them some, it is true; but the crowded ones seem willing to wait their turn, and in this way the crop ripens gradually, instead of all at once.

**Preparing the Soil.** — The soil for round, spring radishes must be rich and light at the point where they are growing. It need not be very deep, nor much enriched with dressing. Nitrate of soda or commercial fertilizer, a pound or two in the twenty-foot row, mixed into the earth three inches deep, will give good results. If a handful of nitrate of soda is dropped into a gallon waterpot of water, and the growing plants are sprinkled with the solution, it will stimulate rapid growth.

### Summer and Winter Radishes

When the hot weather comes on, the small spring radishes no longer do well. The large summer types, like the *Stuttgart* and *Strasburg*, supply the demand during the season. Later still, the winter radishes, such as the *White Chinese*, or *Japanese*

varieties, may be gathered and kept well into the winter, in a cool cellar. These radishes should be planted in rich soil during June or July. They are planted in drills and handled like spring radishes, but they must be given plenty of room, three or four inches, in rows fifteen inches apart.

The *White Chinese*, which is the same in general as the *California Mammoth White* radish, will grow to a foot in length and nearly half a foot through, with crisp, delicate flesh. It is excellent to mix with salads.

### A Radish Pest

The only pest which harms radishes much is the root maggot. This does more harm to the long varieties than to the round types, and frequently spoils a crop. If the maggots are numerous, plant other crops in that spot and move the radish row to a new location, turning the earth over thoroughly twice before putting in the seed. The richer the earth and the faster the growth, the less chance the maggot will have.

# CHAPTER XX

## RHUBARB

HAVING once enjoyed rhubarb, young and fresh from your own garden, you will not be without it again. Rhubarb of the same quality simply cannot be bought in the markets. It is the earliest gift from the garden in the spring, pushing out its crisp, acid stalk at the first invitation of the sun. Being very easy to plant and care for, rhubarb should have a place in every home garden.

The *Linnæus*, often called *Cherry* rhubarb, is the most desirable variety. It has red stalks, when properly shaded, which are of the finest quality, and which grow two feet long when well enriched.

### PLANTING

**Growing from Roots.** — Rhubarb should be grown from roots. It may be grown from seed, but this will take a year or more longer than when grown from roots. The roots cost little and produce edible stalks within a few weeks. Spring is the best season for setting out the roots; but they may be put out in the fall successfully, if that is more convenient.

**Preparing the Bed.** — It is much better to have the plants in a group, than in a row. Nine hills, four feet apart each way, will provide the ordinary family with plenty for daily use and for canning. By planting in a group, one gains the advantage of the shade of one plant for its neighbors, which

LINNÆUS RHUBARB IN PERFECT CONDITION

Many stalks in this bed weighed two pounds each. A quarter of a ton has frequently been cut in one day.

not only makes the stalks longer and better, but keeps the weeds thoroughly in check.

Prepare the bed with the greatest care, if you want fruit of the first quality. The best way is to dig out the top soil for a foot, at least; two feet is not too much. Return the richest part of this soil, free from stones, with stable or dairy dressing, in layers of equal amounts. Set in the roots so that the crowns come about two inches below the surface.

These will rise gradually and be just at the surface after a year or so.

## Care of Plants

**When to Pull Rhubarb.** — There seems to be no good reason for waiting a year to pull rhubarb, as frequently advised. Good-sized roots, set in the

Cutting and Weighing Rhubarb

spring in rich soil, seem to suffer little harm if used that summer; though it is not wise to draw too heavily on them the first year.

As the stalks develop, the crimp in the leaf straightens out. Judge by this in pulling, not by the size of the stalk. When the leaf is smooth, the stalk is passing its best condition. Reach well down to the ground, take firm hold, and pull with a

slight twist sideways. In cutting off the leaves, an inch or so of the " toe " should be left on the stalk. It keeps better in that way.

Do not throw the leaves down in a pile to rot; they breed thousands of flies. They are relished by poultry, and some should be thrown to the hens. The rest should be returned to the patch, scattered among the hills, as soon as they wilt.

**Importance of Shade for Stalks.** — Never pull so many stalks from one hill that you leave it bare. Always have enough leaves to shade it, as this encourages the others to shoot up into the sunlight above them, making them twice as long as they would otherwise be, greatly improving the quality by the rapid growth, and deepening the color. Stalks grown on the edges of the hill will frequently be pale green, short, and tough, while those in the center are bright red, long, and crisp.

Rhubarb may be pulled at any time during the summer when needed, if care is taken to leave enough always to form a complete shade over the patch. As the season advances, the stalks come more slowly, and not a great deal can be pulled at one time.

As the white blossoms appear, cut them off. These should never be allowed to ripen at any part of the season, for they greatly weaken the roots.

**Fall Care.** — In the fall, put several forkfuls of dressing about each hill; also put garden trash, such

as dead bean vines and tomato vines, over the crowns. Do not cover the crowns with dressing, or with heavy, dense matter. The open vines will protect them, without shutting off the air. In the spring, to obtain early stalks, put some fresh dressing around the hills and place barrels, with bottoms knocked out, over the crowns.

A Thriving School Garden

# CHAPTER XXI

## SQUASH

Squashes, in many parts of the country, are very easy to grow. They lend themselves so readily to ground unsuited for fine cultivation, that they are a most desirable choice for all small gardens which have odd corners. A place that has been filled in, an ash pile, or a steep bank, will do as well to grow squashes on as the level garden plot, if the hill where the seeds are planted is carefully prepared and well enriched. There are two distinct types of squash suited to garden culture: summer squashes, which do not keep long after they are picked; and winter squashes, which are gathered in the fall, to be kept and used all winter. Some seedsmen are now offering squashes which combine the qualities of both these types; but they are not largely grown as yet.

### Summer Squash

Summer squash, if planted early in the cold frame or window box, may be placed on the table early in July. It is very sensitive to frost and to cold, damp weather; so it must either be protected during the

SUMMER SQUASH, READY TO SET IN THE GARDEN

This sod was dropped twice while being photographed, was planted, dug up and photographed again, and continued to flourish. The roots were protected by the tough sod.

cool spring days, or planted after warm weather has set in.

**Varieties.** — There are two varieties of the summer squash which are found generally in garden plots: the early *Bush* squash, both white and yellow; and the *Crookneck*, which starts with a bush habit and grows into a short vine as it develops. Besides these, there is the *Vegetable Marrow*, a summer squash widely used in England and now being recommended in America.

ARLINGTON SUMMER CROOKNECK SQUASH

The *Bush* squash is a favorite in southern states, where it is called the "Patty Pan." It has smooth white or yellow fruit, shaped like a thick button, and weighing a pound or more according to variety. This squash is easy to grow, ripens quickly, and, on account of its bushy habit, takes little room in the garden. The flesh is, however, rather flat and watery when cooked. In many parts of the country it is fast giving place to the *Crookneck* type.

The *Crookneck* squash is long, with a tail which

frequently curls half round, and its yellow skin is covered with warts. It does not ripen quite so early nor fruit so fully as the *Bush* squash, but three or four hills will provide an ample supply for the average family. It is superior in quality, having a rich, buttery flavor when boiled and mashed; it is also excellent when cut into slices and fried.

The *Vegetable Marrow* is found in several different types of vine and in various shapes and colors. Those from England are usually light green or whitish in color and shaped like large cucumbers, while Italy sends one which is a mottled green. They are delicate in flavor if picked while young, and are of hardy growth.

**Planting Summer Squash.** — For the early vines, summer squash should be planted in the window box. As squash vines die quickly if their roots are hurt, sods are the best to plant in. Cut sods about four inches square and place them in the box, grass side down. The older they are, the better, so long as they are firm. Then open holes with the finger and push in three or four seeds, a half inch deep and an inch apart. By the time the garden is ready, these will be well up and the second leaves will be out, if the sod is kept warm and well watered.

If the seeds are to be planted in the garden, wait till warm weather is assured. Then pick out some place where other plants might have difficulty. Dig up spots four feet apart, about two feet square,

and remove all lumps and stones. Make the earth here rich with compost, or well-decayed dressing of any kind. If you have no dressing, the squash must be planted where the soil is itself loamy and rich, as it is not possible to get good results by enriching poor ground with commercial fertilizers; too much nitrogen will drive the plant to vines rather than squashes. One is not likely, however, to get the hills too rich with rotted manure, or compost. In England, vines are started right in the great heaps of dressing, and produce wonderful crops. A half barrow-load is not too much for a hill, if the earth is poor. If commercial fertilizer must be used, mix two handfuls in the hill. Get some ground bone at the butcher's and mix in a pound of that a little later as the plants are starting.

The surest way of getting a quick start is to bring the hill up to a level with the surrounding soil and see that the dressing is well mixed in and trodden down. Then scatter a dozen seeds over the spot and sift half an inch of soft, light loam above them. Make this firm and sift a thin dust mulch above it. If a heavy rain comes before the seeds have sprouted, it will be likely to pack down and crust over this dust mulch. In that case, sift another dust mulch over the surface of the hill to keep it soft and moist.

**Culture.** — When the sprouts appear, they should be gradually thinned out, leaving not over two strong plants to a hill.

Keep the earth about the hills well stirred, till it is covered with the foliage. After that the weeds which struggle to the light can be easily pulled out by hand.

As the blossoms appear, remember that on this plant, as on the cucumber, there are male, or staminate blossoms, which bear no fruit. These are the flowers that appear on the long stems. The female blossoms must be fertilized by the pollen from these before they produce fruits.

Watch the squashes as they develop. They must be gathered before the skin and seeds get hard. It is not easy to judge by the size, as some ripen before they have grown very large. Try them with the thumb nail. If the skin is too hard, it will resist the pressure. Such squashes should be cut off and discarded, for, if left on the vines, they will draw greatly on the roots for nourishment to ripen their seeds.

As summer squashes demand a good deal of water, a practical method for the home or school garden is to plant four hills in a square, four feet apart. An old pail or keg, with holes in the bottom, may be sunk in the center of the square and filled with water during dry weather. This supplies the moisture from below and draws the roots down toward the cool, moist subsoil. Summer squashes thus watered, if they are well nourished, and if none are allowed to ripen, will keep on producing good fruit till killed by a heavy frost.

## Winter Squash

**Varieties.** — In the northern states, the *Hubbard* squash is planted more than all others for winter use. This is offered in various strains. It is hardy, produces heavy crops, and keeps well all winter. It

Hubbard Squash

is of excellent quality, both for eating as a vegetable and for making pies.

In the southern belt the *Hubbard* squash does not seem to thrive in many locations, and there the *Boston Marrow* is largely favored. It grows and fruits quickly, seems to enjoy hot, humid climates, and keeps well. The squashes are heart-shaped and colored a warm orange red. The flesh is deep yellow

and, while not so thick as the *Hubbard*, is of excellent quality.

**Planting.** — Winter squash does not need early planting, except in the northern states. It is desirable to have the crop maturing as cold weather approaches, as it is not easy to keep, through the winter, squashes which have ripened during hot weather. Moreover, the late planted squash makes more rapid growth, and is better able to overcome insect enemies, which become less troublesome as the season advances.

In all except the northern states, winter squash may be planted as late as the first of July, with good chances for a crop. Land where early crops have been grown may thus be used for winter squash. The hills should be prepared as for summer squash, but, as the vines run twenty or thirty feet, the hills must be six or eight feet apart.

It is often suggested that squashes be planted in the corn rows; but this is not good practice, except where the corn land is extremely rich. The squash vine is a greedy feeder, and corn roots have very good appetites themselves. To feed both properly will not be easy. Moreover, the vines will be in the way of the harrow as soon as they get started. It is much better to put the squashes by themselves. They may be placed in rough spots and odd corners where fine cultivation is difficult. If a piece of land gets beyond control, and weeds choke early crops, as

frequently happens during a wet spring, make the hills and plant the squashes there. The big squash leaves will soon cover the ground and master the weeds, producing a good crop, and greatly improving the land for the next year.

**Culture.** — The squash crop is easy to handle, as there is little to do after the vines start, except to keep the ground well worked till the leaves cover it. Plant ten or a dozen seeds in a hill and thin out the plants, leaving not over two. In planting squash, put in a few radish seeds also to tempt the black flies or striped beetles from the squash plants. If these winged pests are too numerous, the screens may be used, as planned for cucumbers. If the soil is rich, the big squash sprout usually grows quickly, in spite of their attacks.

If the vines are running rather long, as the growing season advances, cut off the ends. This will give the fruit more strength for growth, and will keep the vigor for the new squashes rather than for more vines.

**Gathering Squashes.** — Squashes are not hurt by a light frost, but it is just as well to have them under cover when frost is expected. Cut them from the vines, leaving the stem of the squash in its place. Do not cut it shorter than three inches. They may then be placed on a sunny piazza for a week or two. Throw an old blanket over them, if the night promises much frost. Then, when the fires are started in the house, put them in a dry, warm place where they can

have plenty of air. A cellar usually is not suitable, though if it is dry and airy, it may do. Placing them in a back room over the kitchen or in the attic of a well-heated house should preserve them in good condition the winter through.

### Enemies

There is no general disease which is likely to attack the squash vine. If a humid spell in certain localities tends to develop wilt, a light spraying of Bordeaux would be required.

**The Vine-Borer.** — There is, however, a worm, the vine-borer, now prevailing in many parts of the country, that makes squash culture a precarious task unless the greatest care is taken to fight it. The vine-borer has not as yet reached the northern states in numbers, but seems to be on its way. The grubs live in the soil and do not make themselves known till the plant is well started and full of promise. Then the leaves wilt, yellow spots appear, and in a few days the luxuriant vine lies dying on the ground. A close examination of the stem down near the earth will disclose a small hole. If you slit the stem above this hole, you will probably find the whitish worm in the tunnel he has made. He cuts across the veins of the plant and sucks out the sap as it comes from the roots.

This pest is especially dangerous to the vines, because it is usually too late when he is detected.

However, it is possible to grow the vines in spite of the vine-borer, if care is taken.

If this enemy is numerous in your locality, prepare for him before you see him. Camphor, or black pepper, sprinkled about the roots of the growing plant while it is still small, will tend to drive him away. Supplement this precaution by a good deal of arsenate of lead, or Pyrox spray, with the hand sprayer, when you are spraying cucumbers and other plants. Put this spray all round the stem, close down by the roots. It will kill the worm before he has done much harm, if he tries to eat his way through it. Later on, the flies developed from these grubs evidently lay their eggs at spots along the vines near the juncture of the leaf stems. These eggs soon hatch, and the grubs work in from these spots. Fortunately, however, if the vine is well nourished, it will by this time be so large that these late grubs cannot kill the plant.

If, in spite of this care, the vine suddenly begins to wilt, examine the stem, locate the hole, and slit the vine just above it with a thin knife. In this way, you can get the slug and kill him. If the vine is not greatly wilted, cover the wounded stem with earth, and it may recover. But if it is too feeble to save, and yellow spots have appeared, pull it out and burn it. Kill every slug you can.

**Beetles.** — Besides the vine-borer, several kinds of beetle attack squash vines; but, as they work usually

on the leaves, they seldom do much harm. The striped beetles which often attack young leaves and fruit may be kept away by arsenatè spray, or by tobacco dust, sprinkled on the leaves in the early morning. The large gray beetles, often called squash bugs, gather in large groups beneath the leaves later in the season. In the morning, when the beetles are cold, the leaves on which they have congregated may be removed and the beetles destroyed. If a shingle or piece of board is laid on the ground near the vines, these bugs will creep under it in large numbers on cool nights and may be killed in the morning.

Squashes, like most other plants, depend upon sturdy growth for strength to overcome their enemies. If they are weak and stunted through lack of proper care, the most anxious protection will hardly make them a success. If they have a good start, and plenty of nourishment, they will overcome their foes and ripen their fruits.

### Pumpkins

Pumpkins have the general habits of the winter squash, but require very little care. They are easily planted by dropping a few seeds here and there among the late corn. They are quick to grow, seeming to draw little nourishment from the soil, and requiring hardly any help to ripen a full crop.

**Kind to Choose.** — There are several varieties of pumpkin, but most of them are not properly garden plants, as they are better fitted for stock feed than for human beings. The small sugar pumpkins, however, make good pies and are much esteemed in that form by many. The *Winter Luxury* is a pumpkin of this type that is well recommended.

**Planting.** — It would hardly seem wise to give much space in the small garden to the pumpkin, but usually there are hills of sweet corn, here and there, which do not get well started. A few pumpkin seed, four or five, planted half an inch deep at such places, will grow well and will not take up valuable room. Leave the two best plants after they are well started, and pull out the rest.

Pumpkins have no enemies that trouble them much, and are picked and stored in the same way that squashes are handled.

# CHAPTER XXII

## SPINACH

**Varieties.** — Various names are given to varieties of spinach, which are much the same in growth and characteristics.

*All Season* spinach is especially recommended, because of its tendency to keep fresh and tender without going to seed, during hot weather. It grows close to the ground and has heavy, crumpled leaves of the best quality.

*Victoria* is another type which remains in good condition for some time without going to seed. It has the "savoy" leaf, and is much esteemed for its excellent flavor.

Perhaps the most satisfactory variety for the home garden is *New Zealand* spinach. Other types ripen so that the whole crop must be gathered to keep it from going to seed, but *New Zealand* spinach sends out large shoots, or branches, which may be nipped off from time to time. When the plant is trimmed, it promptly sends out new shoots, keeping up a rapid growth all summer long. The end stems and leaves are soft and fleshy, but the

thicker stems should be discarded as the hot weather comes on.

**Cultivation.** — In regions where the winter is not especially severe, spinach may be planted in the fall. The young plants are covered lightly with straw or other light litter and are ready to make rapid growth as soon as the ground melts in the spring.

Prepare the ground thoroughly and enrich it well. Barnyard dressing is especially valuable for spinach. Sow the seed in rows about a foot apart, possibly a little more. The seed sprouts well and should not be sown thicker than two or three to the inch.

As the plants get an inch or so high, thin out, leaving them two inches apart. When these plants have developed so that they crowd, they should again be thinned out, leaving them at least four inches apart. These plants are suitable for table use. If the plants grow well, they will be crowding again before long, and again they should be thinned out and cooked.

The larger sorts, like the *New Zealand* spinach, need plenty of room, at least a foot each way. Never let the *New Zealand* variety grow rank and coarse. Keep the shoots pinched back, whether you need them for the table or not, otherwise they will soon become tough and fibrous.

# CHAPTER XXIII

## TOMATOES

One of the most profitable plants for the small garden is the tomato. It is easy to plant and care for, is free from disease, and is easily protected from enemies among the insects and worms. A dozen plants do not take up much space, but, if well developed when set out, will provide the family with plenty of tomatoes, and give them some to can besides. The green tomatoes left on the vines in the fall make, when pickled, a great addition to the winter bill of fare. The tomato can be served in so many ways and is such a favorite vege-

A Tomato Club Girl

table, that it should be chosen among the very first plants for the small garden.

## Kinds to Choose

There are three important kinds of tomato, all of which are desirable in the garden: the early tomatoes, represented well by the *Earliana* strains; the general crop of red tomatoes, among which the *Stone* has a very wide demand; and the *Dwarf Champion*, known as a pink tomato, a medium early.

**Earliana.** — There are many strains of the *Earliana* tomato, widely recognized as the best tomato for an early crop. It is of strong growth, resists cold fairly well, and bears a very good crop of excellent fruit. The color is bright red, the shape generally good, and the flavor rather acid, but pleasant. It does not bear very heavily, and the tomatoes are inclined to be small; but it is worth while to have some plants which ripen early.

If you live in the northern belt of the United States, this is the variety you will have to depend upon for your main crop. Tomatoes are hard to ripen where the nights are chilly. The very earliest strains are none too hardy in the northern states, where the season is short and cool.

**Stone.** — The *Stone* tomato has a national reputation as a variety for the general crop. It has an extremely strong growth and continues bearing till frost. The fruit is round and smooth, having a

good flavor and solid flesh. Many strains of the *Stone* tomato have been developed to suit local conditions. There is usually some gardener in every locality who has developed a strain which gives him great satisfaction, and it is a good plan to get your plants from him.

**Dwarf Champion.** — The dwarf tomatoes, called pink tomatoes in the market, have been gradually growing in favor, and today are found in almost every state. Both the names " dwarf " and " pink " are rather misleading. The color is not really pink but rather a dull crimson. Neither the vines nor the fruit, as the strains are developed today, are by any means dwarf. They class among the largest. At about the end of the first month out of doors the vine stands as a stiff, compact bush, which may be the reason for calling it a dwarf.

As soon as the fruit forms, however, these stalks will break down and lie upon the ground if they are not supported, and the vines will extend several feet in all directions from the parent stalk. These pink tomatoes are excellent for eating raw. They are very solid and cut into firm slices. The flavor is much less acid than that of the red tomato, and on this account many people prefer the pink variety.

### Planting the Seed

**Home-Grown Seeds.** — Tomato seed from any reliable house will prove satisfactory. You may,

however, find some strain near home which makes you ambitious to plant that particular kind. There are not many cases where it is advisable for the amateur to try to save his own seed, but the tomato is one plant which is easy to propagate successfully from home-grown seed. You can tell at once which plant is doing the best for you, and can pick the best specimens from this plant for your next crop. When the fruit is fully ripe, take out the seed, soak it a day or so in water, shake it, and clean it in a sieve, spread it out to dry on a newspaper, and put it away in an envelope, plainly marked.

READY FOR THE FIELD
A dozen Earlianas, grown in window boxes.

**Preparing a Window Box.** — It is easy to plant tomato seed at home or at school. Such planting is especially useful in school to stimulate interest, as this seed is planted about the last of February in the temperate belt, and it awakens the thoughts of the children to the spring that is ahead. Put into a box, about ten inches by twelve or fifteen, three inches of rich, light earth. This earth must

be prepared according to the directions given in the chapter on fertilizer. Ordinary earth from the garden is not suitable. It will be likely to pack down in the box, and the seed will have little encouragement to sprout.

**Drainage.** — Be sure to provide drainage, so that the water will not stand in the box. If the joints are water-tight, holes must be made in the bottom. If care is used in watering the earth, little water will run out; but if the children are to handle the seed box, a tray to catch the surplus water had better be provided. This may be bought for the purpose, or any flat pan will serve well enough. The preparation of these boxes gives an excellent exercise for the manual training hour.

**Planting.** — When the earth is ready, with a match make little holes an inch apart and one fourth of an inch deep. Into each of these drop two seeds. This should be done about eight or ten weeks before it is time to set the plants in the garden.

**Transplanting.** — If two seeds sprout in the same place, it is wise to cut off the smaller plant, letting one little plant grow in each spot. When they are two inches high, either transplant to a hotbed if you have one, or get another box and set out the plants in the two boxes, two inches apart. Pots are sometimes recommended for this purpose, but they make a great deal more work than a box and seldom bring as good results.

When the young plants are set out in this way, moved from their first sprouting place, the result is to strengthen the root growth a good deal, while the top is made more stocky and shorter. It will be an interesting experiment for the schoolroom to take a plant which has been transplanted, wash the earth carefully from the roots, and compare the root growth with that of a plant which has always grown where it first rooted.

### Setting Out in the Garden

When the leaves are half grown on the maples, it is time to set the tomatoes in the open ground. For these plants you may use the poorer part of the garden plot, as tomatoes do well in sandy or gravelly soil, and it is comparatively easy to prepare the soil about each plant to suit its needs. As the roots are already well grown, the nice cultivation required for the smaller plants is not needed for tomatoes.

**Preparing the Soil.** — With the spading fork, dig holes about a foot deep and two feet across, and make sure that the stones are removed. Then mix a shovelful of well-rotted dairy dressing, or a handful of commercial fertilizer, thoroughly with the earth, as it is put back into the hole. Too much fertilizer will grow vines instead of fruit. See that the soil is well moistened.

**Paper Collars.** — Before setting in the ground, strip the lower leaves from the stalk and wrap a

piece of newspaper about four inches wide around the stalk, just above the root. The plant should be protected for at least two inches above the level of the earth. This will cost nothing, will take but a moment, and will save the plant from cutworms, which are especially fond of young tomato plants.

A Half Acre of Dwarf Champion Tomatoes

The plants now stand erect like potatoes. In another month they will be sprawling on the ground.

**Depth of Planting.** — The root of the tomato plant should be set about four inches deep. Remember that air is an important element that must get freely to the roots of most growing plants. If they are set too deep, the air cannot get to them, and growth is seriously hindered. If the stalk is over a foot high and inclined to be spindling, set it so that the root is about four inches deep, and the top

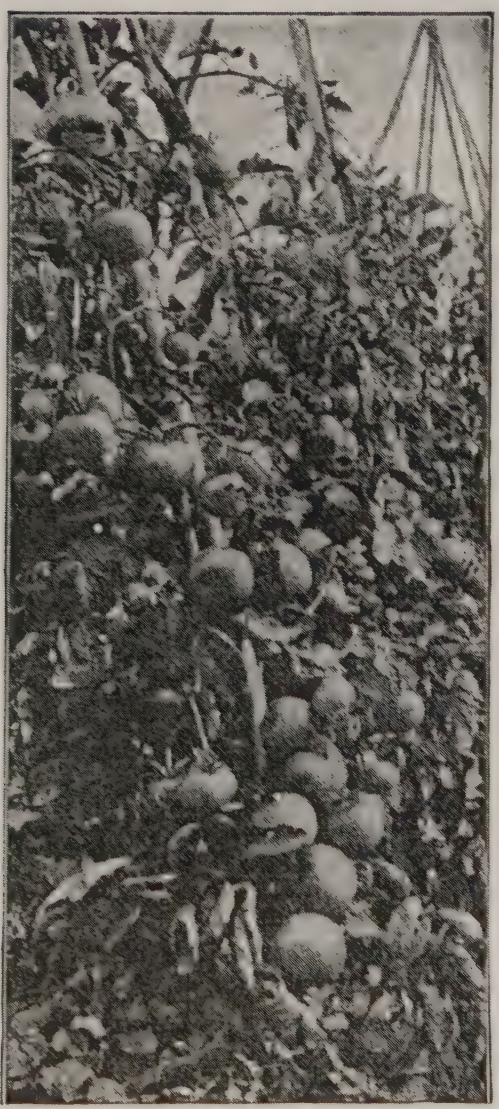
slants upward at an angle. In this way the stalk is well covered and protected, though the root is not down too deep. New roots will form along the slender stalk and give added strength to the young plant.

### Spraying Tomatoes

While you are out with your spray pump or powder box, it is a good idea to give the tomatoes a light spraying with Pyrox or some combination of like nature. It is not likely that any serious attack will be made on the vines, but they do at times suffer from blight. The year 1916 was very wet and humid in the East, and many tomatoes were hurt by blight where blight had not been known before. The flea beetle also attacks the leaves, turning them yellow, and sapping the vine of much strength. Then there is a huge green worm which will chew a preposterous lunch out of a plant here and there, if there is no poison. It is worth a great deal to know that your vines are in good health and insured.

### Vine Culture

**Supports for Tomato Vines.** — There are two methods of culture for tomato vines which give good results: tying to trellises or stakes, and allowing them to run on the ground. In some places, where the climate is moist and hot, it will probably be safest to tie them to trellises or stakes. To do this,



TOMATOES, TRAINED ON SMALL POLES, PRODUCE A GENEROUS CROP

a support of some kind must be provided for the tomato to run upon. Stakes may be driven close to the plant. Then one, two, or three stalks may be tied with bits of tape or rag strips, and trained to climb up the stake. This post should be strong and at least five feet high. For general crops, at least three stalks should be left. Then the shoots, which constantly start off in all directions, must be trimmed back every few days, leaving the strength of the roots to go into the fruit, which is growing along the main stems.

A more convenient way for the ordinary gardener is to make a low fence along the row of plants, leave most of the sprouting branches, and tie them up to the wire or laths which

form the rails of the fence. Where two rows of tomatoes are placed four feet from each other, this fence may be made of pieces of scantling with laths tacked on.

**Tying up Tomatoes Means Work.** — Although the method of tying up and trimming back the vines appeals to many people who grow tomatoes, and may be necessary in certain humid climates, it calls for a great deal of work and attention when other crops are also calling for help. To tie up properly and trim even a dozen plants is no small job in the hot midsummer days.

**Allowing Plants to Run on the Ground.** — Experience in several different states shows that under ordinary conditions there is no bad result, and much advantage, from letting the vines run on the ground. As the branches grow out and begin to drop to the earth, give the plot a thorough harrowing, three or four inches deep. Then sprinkle lawn clippings about them to form a mulch and let the vines run at will, moving the branches so that they do not interfere with each other.

A Sod Placed on Tomato Vines Causes Them to Root again and Increases the Crop

As the vines increase in length, place pieces of sod with the grass side

down, about fifteen inches apart on the vine. The sods should be about three inches wide, and six inches long, just heavy enough to hold the vine in place. New roots will form under the sod, and the vines will gain so much added strength that the crop will be practically doubled; the vines will thrive, even in the long, dry spells which are frequently encountered in August just as the fruit is ripening.

### Picking

Do not leave the fruit on the vines to ripen. It is better to pick it as soon as it is turning pink and put it in a dark place. If you want the fruit as soon as possible, have the temperature warm where the tomatoes are kept, as warmth will ripen them more quickly. If they are coming on as fast as needed, it is better to keep them cool. A box or a drawer in the pantry answers well.

**Advantages of Ripening Tomatoes in the Dark.** — By picking the fruit in this way a good deal is gained. As the chief drain on a plant comes in ripening the fruit and seeds, the more we can save it from this drain, the greater strength it will have for developing the fruit left on the vines and for setting new tomatoes. If well cared for, the plants will continue to blossom and form fruit till checked by the cold.

By gathering the fruit before it is ripe, you get it in better condition, for stray bugs or worms may

take a bite as it gets riper, and a crack may come here and there.

Tomatoes ripen more evenly in a dark place, and the flesh is firmer as well as more free from tough spots and streaks. When you have tried this method once, you will not care to use any other.

GIRLS ARE ESPECIALLY FOND OF TOMATO CULTURE

**Green Tomatoes.** — Watch the weather as the season for frost approaches, and get the green tomatoes under cover before they get nipped. Then you can enjoy ripe tomatoes well into the winter. Pick out the small ones and those of poor shape, for pickle. The rest should be put in a drawer or box where they will be cool, but not frozen. The cellar is a good place, as the temperature is likely to be even there. By the time the last one is eaten, it will be almost time to get out the window boxes again for the next crop.

# CHAPTER XXIV

## TURNIPS

One of the easiest vegetables to grow in the home or school garden is the turnip. It is so quick to sprout and so rapid in growth that it satisfies the demands of those gardeners who want to see quick returns for their labors. Turnips will grow on almost any soil, but the quality of the crop will vary according to the soil where the turnips are planted. If table turnips of the best quality are desired, have the soil rich and fine as you would for any table crop. Quality depends on quick growth; quick growth depends on soil and culture.

**Kinds to Grow.** — There are several kinds of turnip which do not vary greatly as to flavor. The *White Milan* and *Early Purple Top* are both flat turnips of rapid growth and white flesh. They are well suited for summer turnips. The *Purple Top Strap Leaf* is another white-fleshed turnip of good flavor, a little later in ripening.

Beside the white, early turnips, there are the yellow sorts, called *Swedes* or *Ruta Bagas*. These are much larger than the white turnips, usually have

yellow flesh, and are extremely solid. They keep well through the winter and are much favored in the north.

**Culture.** — Turnips for immediate use may be planted as soon as radishes or beets, or when the ground is soft and mellow. Those for winter use should not be planted till July, as long growth will make them tough.

Make the ground soft and fine. If a crop has already grown there, add a pound of commercial fertilizer for each twenty-foot row and rake it in. Sow the seed thinly, not more than two to the inch. It is quick to sprout and of strong growth. In the spring, plant it in furrows a half inch deep, making them a full inch deep when the sun is hot in July.

Cultivate to keep the soil loose and the weeds out. When the plants are two inches high, thin out, leaving them four or five inches apart.

The turnip family is not likely to suffer from any pest or disease.

When the frosty days approach, gather the crop and put it down cellar in a cool spot. It keeps better if covered with light loam or sand. Frost does not hurt turnips, if they are to be used right from the ground, but they keep better if untouched by frost.

# CHAPTER XXV

## CANNING AND DRYING

### Canning

Every family that has a garden should have a simple canning outfit to go with it. There is always a surplus of many crops, which, if they are not canned, are wasted and lost. Food is too important, too costly, to allow a bit of it to go to waste. When the simple methods of canning are carefully followed, the vegetables and fruits which are put up at home are superior to those offered in the stores. One knows just what goes into the cans and has the great satisfaction of making the garden last the year round.

The outfit needed for successful canning is not expensive, and most of the necessaries are found in every household. The use of tin cans is not practicable in the home. Tin cans cost a good deal and may be used once only. They require a special soldering kit, and it takes skill to solder the covers properly. Glass jars cost a little more than tins, but they are clean and sweet and may be used year after year.

The cold pack method of preserving vegetables in jars is so simple and so sure of success, that this is recommended for all the products of the home or school garden.

### Utensils Necessary for Canning

The utensils needed for canning are most of them already present in the kitchen. Paring knives, spoons, measuring cups, bowls, and kettles are already at hand. A large boiling kettle, however, preferably of agate ware, holding at least ten quarts, should be provided before the season begins. Glass jars of the lightning type, having glass covers that snap on, are the most desirable containers. Pint jars are large enough for many of the smaller fruits and vegetables. Quart jars are best for beets, tomatoes, and the larger fruits and vegetables. For these jars *new* rubbers of good quality should be obtained. It is dangerous to use old or stiff rubbers.

To fill the jars easily and keep the contents in good condition, get a funnel with a wide mouth, which fits into the top of the jar. With this, all small vegetables can be poured directly into the jar.

Any utensil large enough to hold the jars, and water to cover them, will serve as a boiler, or sterilizer. Sterilizers of all sizes and prices may be purchased. A wash boiler is frequently used, while a galvanized washtub is excellent, if provided with

a cover. One tub set above another will make a satisfactory cover.

In the bottom of the sterilizer a rack must be placed, to keep the jars from resting flat on the bottom and coming into direct contact with the heat. This may be of wooden slats, or of chicken wire. With a hook of some kind to lift the jars from the boiling water, such as a button-hook, or a wire fork bent over at the points, and a wire basket which fits into the large agate kettle, the outfit is complete.

| | |
|---|---|
| Jars | Funnel |
| New Rubbers | Bowls |
| Spoons | Large Kettle |
| Paring Knives | Wire Basket |
| Measuring Cups | Sterilizer |
| Rack | |

### General Method

Prepare your jars by washing them carefully. Be *sure* that a new elastic ring to *fit* each jar is at hand. Be *sure* that your covers fit all jars before you fill them. Place the sterilizer on the stove, with water enough to nearly cover the jars, and let this water be warming while you prepare the material to be canned. Be sure that the different tools needed are on hand.

**String Beans.** — Have the beans as fresh as possible, and take every precaution to have them young

MEMBERS OF A CANNING CLUB AT HARVARD, MASSACHUSETTS

and tender. Tough fibers are very noticeable in string beans when they are canned. Wash them thoroughly. Beans may be canned whole, but most families will find it more convenient to cut them in pieces, ready to serve direct from the cans.

Boil the beans in the large kettle for fifteen minutes. While they are boiling, warm the jars in warm water and place them near at hand.

Pour off the boiling water from the beans and rinse them in cold water in the wire basket. Then pack them into the jars. Shake down well and fill to the top.

Add one level teaspoonful of salt to each quart jar, one half teaspoonful to each pint.

Fill the jars with boiling water, remembering that the glass must be warm when the boiling water is poured in.

Put the rubber ring in place and set the cover on the jar. Draw up the upper wire across the cover to hold it in place, but do not snap the spring wire down.

Put the jars in the sterilizer and boil an hour and a half.

After an hour and a half of boiling, take the jars from the boiler, snap the cover springs down, and stand them upside down to cool. Be sure they do not stand in a draft while cooling.

The jars may be tested next day to see if they are perfectly sealed. Loosen the spring and raise the

jar by the cover. If the cover loosens, examine the jar and rubber and try to make a perfect seal. These beans should be sterilized twenty minutes before snapping the spring again.

Store the jars in a dark, cool place, free from frost. If you put them in the pantry, be sure to think of the jars if the family leaves home in the winter. If the furnace fire goes out they will freeze and burst. The cellar is the safest place.

**Tomatoes.** — Select ripe, sound tomatoes, and scald about two minutes to loosen the skin. Dip in cold water to arrest all further cooking, remove the core and skin. Many recipes advise packing tomatoes whole. They will always shrink in the jars while sterilizing, if packed whole, and leave a space at the top of the jar. It will probably be found better to mash them into the jar. Add one teaspoonful of salt to each quart jar, and fill the space in the jar with tomato juice obtained by crushing and straining the inferior tomatoes. Proceed as directed under beans, boiling about twenty minutes.

**Asparagus.** — Cut the stalks to fit the jars and proceed as directed under beans. Boil one hour.

**Beets and Carrots.** — Wash them clean, boil ten minutes, remove the skins, and treat them the same as beans. Boil one hour and a half.

**Cauliflower.** — Remove the solid head and separate the small sections. Place them in cold water

for a half hour to make them crisp. Boil five minutes, dip in cold water, and place in jars the same as beans. Boil one hour.

**Corn.** — Boil the ears ten minutes. Dip in cold water. Then cut the corn from the cob. Do not pack the jars quite full, as corn is likely to swell. Fill the jar with boiling water. Salt as for beans and all vegetables. Boil three hours.

**Spinach, Chard, and Other Greens.** — Wash the greens thoroughly in plenty of water and boil in the large kettle for fifteen minutes. Pack tightly into the jars, add salt, and hot water to fill the jar completely. For the rest, proceed as directed under beans, and boil one hour.

**Peas.** — Shell, and can by the same method used for beans, but do not fill the jars quite full of peas, as they swell in cooking.

## Drying

A great deal is being written and said at present about drying vegetables instead of putting them up in cans or glass. It should be remembered in this connection that drying is by no means a new idea. It was formerly the chief method of preserving the fruits and vegetables for winter use, and was given up almost entirely in the eastern part of the country when glass jars became common.

The change from drying to preserving in jars or cans was not made without good reason, and those

EVAPORATING CLUB GIRLS AT HARVARD, MASSACHUSETTS, DRYING FRUITS AND VEGETABLES

reasons are mainly as important today as they ever were. Two points are important in preserving food by evaporation: first, the food must be dried thoroughly by slow, even evaporation; second, it must be kept free from worms and insects.

Drying by the natural warmth of the sun and air in the eastern states is a difficult problem. Dur-

DRYING VEGETABLES BY MEANS OF AN ELECTRIC FAN

ing many weeks in the summer the humidity is high, and frequent showers are to be expected. This means that food must be watched, carried in and out from sun to shelter, turned over to avoid sweating, and kept on hand for many days before it is fit to store. The present summer (1917) has seen quantities of food spoiled because of continued damp weather. Drying by means of artificial warmth

in the manufactured dryers is much more satisfactory, but this is cumbersome in the home, and some drying outfits have been condemned by fire commissioners as dangerous.

Keeping food free from worms and insects during the late summer and fall months will be found equally difficult. To so protect food that eggs of insects will not be present is practically impossible. To keep these from hatching, in any states except the most northerly ones, is extremely difficult.

On the whole, we should advise against trying to store much food by the drying process until a careful test has been made under different conditions. Full directions for drying and storing various vegetables under the conditions prevailing in different locations can always be obtained from local committees. It is plain that these conditions would vary much in the North, West, South, and East, and instructions given without knowledge of local conditions would only be misleading.

The best plan in most states is to put up food in jars, sealed until needed. The flavor is always much better, no further preparation is needed at the time the food is wanted for the table, the work is usually about one half, and the danger from spoiling is less than half. Drying in the far West and in other states with proper climatic conditions, will prove useful, but elsewhere canning methods will be preferred.

## SEED REQUIRED FOR A FIFTY-FOOT ROW

*Asparagus*, one ounce.
*Beans* (dwarf), one pint.
*Beans* (pole), one half pint.
*Beets*, one ounce.
*Brussels sprouts*, one fourth ounce or less; one ounce grows about 5000 plants.
*Cabbage*, one fourth ounce. If planting outdoors, about twice as many should be used as in seed bed.
*Carrot*, one half ounce.
*Cauliflower*, one tenth ounce.
*Celery*, one sixth ounce.
*Corn*, one fourth pint.
*Cucumbers*, one ounce to fifty hills.
*Kohl-rabi*, one fourth ounce.
*Lettuce*, one sixth ounce.
*Onion seed*, one fourth ounce.
*Onion sets* (small), one quart.
*Parsnips*, one fourth ounce.
*Peas*, one pint.
*Peppers*, one tenth ounce.
*Potatoes*, two quarts.
*Pumpkins*, one ounce, enough for garden use.
*Radish*, one half ounce.
*Spinach*, one half ounce.
*Squash*, one ounce, enough for garden use.
*Tomato*, one ounce of seed will produce at least 3000 plants. Two dozen plants, enough for the ordinary garden.
*Turnip*, one fourth ounce.

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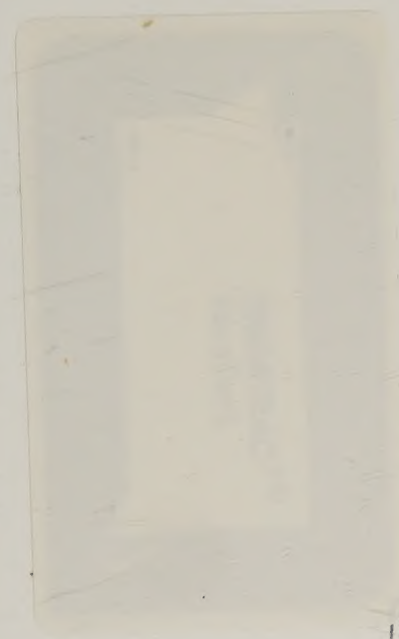

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